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*Attachment W&SR-201B*  
*Preliminary Draft*

# **Biological Resources Assessment for the Cosumnes Power Plant, Sacramento County, California**

Prepared for  
**Sacramento Municipal Utility District**

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June 7, 2002



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# 1.0 Introduction

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Sacramento Municipal Utility District (SMUD) proposes to develop a 1,000-megawatt (MW) natural gas-fired power plant (the Cosumnes Power Plant [CPP]) and 26-mile natural gas pipeline in southern Sacramento County. The purpose of this biological resources assessment (BRA) is to review the proposed CPP project in sufficient detail to determine to what extent the proposed action may affect any of the threatened, endangered, proposed, or sensitive species listed below.

This biological assessment is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (16 U.S.C. 1536(c)), and follows the standards established in the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The U.S. Army Corps of Engineers is the lead federal agency for the proposed project and will oversee compliance with federal laws, ordinances, regulations, and standards (LORS) required for the project, as well as any mitigation and protection measures for sensitive biological resources.

The lead state agency for the CPP project is the California Energy Commission (CEC) who oversees licensing and compliance of LORS for thermal power plants under its jurisdiction. An Application for Certification (AFC) for CPP was prepared under Title 20 of the California Code of Regulations and was submitted to the CEC on September 13, 2001. The AFC process under CEC regulations is the functional equivalent to the California Environmental Quality Act (CEQA). The CEC is the lead state agency for the project and will also oversee compliance with state and federal LORS required for the project, as well as any mitigation and protection measures for sensitive biological resources. The AFC presents a detailed description of the project and addresses potential project impacts to sensitive biological resources in the project area. This BRA further refines the analysis of impacts to special-status species that occur, or could potentially occur, within the CPP project area. This BRA also addresses state-listed species as it may be used during consultation with the California Department of Fish and Game (CDFG) under Fish and Game Code Section 2081 or 2080.1.

## 1.1 Project Location

The project has temporary disturbances and permanent features. The project site is a permanent feature on a 30-acre parcel and is hereafter referred to as the “site”. The CPP project site is located 25 miles southeast of the City of Sacramento, on the eastern edge of the Sacramento Valley in Sacramento County (see Figure 1, all figures are located at the end of the document). The project would be located on a 30-acre parcel about 1,500 feet south of the existing non-operational Rancho Seco Plant (Rancho Seco or RSP) on a portion of a 2,480-acre site owned by SMUD (Figure 2). This location will allow the reuse of existing water systems, switchyards, and transmission lines that are already in place at Rancho Seco. The project is at 150 feet elevation, at the base of the foothills that rise to the Sierra Nevada east of the project. The 0.3-mile water supply line and 0.4-mile electrical transmission line connecting existing RSP features and the CPP site are in the same location and habitat as the project site. Construction of the interconnecting buried water supply line is a temporary disturbance. Stringing the transmission lines would be a temporary disturbance, while the transmission tower footings would be a permanent feature. The 20-acre construction laydown area just south of the project site is a temporary disturbance. The construction access road built on SMUD-owned property would be a permanent feature. The site is

located on the Goose Creek quadrangle, United States Geological Survey (USGS) at Township 6N, Range 8E.

### **Pipeline**

CPP would be served by a 24-inch diameter natural gas pipeline beginning in south Sacramento where it ties into the SMUD system near the Carson Ice-Gen site. It crosses several roadways and is adjacent to railroad rights-of-way in the south County, crosses under several foothill streams and irrigation ditches typical of the Sacramento Valley, and then lies adjacent to the road right-of-way (ROW) along Twin Cities Road and Clay East Road, in predominantly hay fields, alfalfa fields, and vineyards. The gas pipeline alignment is located within the Clay, Galt, Elk Grove, Bruceville, and Florin quadrangles.

In order for the new 26-mile gas line to supply sufficient fuel for Phase 2 of the project, a gas compressor station will need to be added at both Winters, CA and at the valve 190 crosstie in Elk Grove, CA.

### **Compressor Station at 190 Valve Crosstie (second phase)**

The Valve 190 Crosstie Compressor Station will be installed at the existing inter-tie located at the crosstie measurement and valve number 190, which is located within the Sacramento Regional Waste Water Treatment Plant buffer lands, north of the Carson Ice-Gen Plant (see Figure 3). Two gravel access roads lead into the site; one from the west and the other from the south. The compressor is anticipated to be skid mounted, approximately 10 feet x 20 feet x 8 feet high, within a slatted fence enclosure.

### **Compressor Station at Winters, CA (second phase)**

A compressor will be installed within the existing inter-tie station located at 27700B County Road 29 in Winters, CA (see Figure 4). The Winters Compressor Station is located on Road 29 in the SE 1/4 of Section 29, T9N, R1W in Yolo County. Road 29 borders the south side of the compressor station. The compressor is anticipated to be skid mounted, approximately 10 feet x 20 feet x 8 feet high, surrounded on four sides by a block wall for noise attenuation. The existing inter-tie station is currently surrounded by a slatted fence enclosure. The area is surrounded by orchards with the nearest residences about 0.1 mile away.

The region's climate is Mediterranean, characterized by hot, dry summers and cool, wet winters. Summer high temperatures frequently exceed 100 degrees Fahrenheit (°F); winter temperatures are generally mild, with fewer than 20 freezing days per year. Rainfall averages 16.7 inches per year, most of which falls between November and March.

## **1.2 List of Special-Status Species**

A list of special-status species that could occur in the project area was compiled from consultations with U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), CDFG, and the California Natural Diversity Data Base (CNDDB; CDFG 2002) (Appendix A). Recorded locations of special status species, according to the CNDDB search are shown in Figures 5 through 9. For the purposes of this analysis, only those species identified by the agencies as species of concern for the CPP project are fully addressed in this biological assessment. Any special-status species whose habitat is present within the CPP project area was evaluated for potential impacts from construction, operation, and maintenance activities. Other special-status species that were included on the USFWS, CDFG, and NMFS lists whose habitats or known boundaries of distribution do not occur within the project area are included in Table 1 (found at the end of this BRA), but were not evaluated further. These species are identified with an asterisk in Table 1 and are not further evaluated in this BRA.

**Federal Threatened (FT), Endangered (FE), Proposed Threatened (PT) or Proposed Endangered (PE) Species:**

Sacramento Orcutt Grass (*Orcuttia viscida*) FE  
 Vernal pool tadpole shrimp (*Lepidurus packardii*) FE  
 Vernal pool fairy shrimp (*Branchinecta lynchi*) FT  
 Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) FT  
 Spring-run chinook salmon (*Oncorhynchus tshawytscha*) FT  
 Winter-run chinook salmon (*Oncorhynchus tshawytscha*) FE  
 Sacramento splittail (*Pogonichthys macrolepidotus*) FT  
 Central Valley steelhead (*Oncorhynchus mykiss*) FT  
 Giant garter snake (*Thamnophis gigas*) FT  
 Bald Eagle (*Haliaeetus leucocephalus*) FT (proposed Delist)

**Federal Candidate Species (C) and Species of Concern (SC)**

American Peregrine Falcon (*Falco peregrinus anatum*) SE  
 Sacramento Orcutt Grass (*Orcuttia viscida*) SE  
 Legenere (*Legenere limosa*) SC  
 California linderiella (*Linderiella occidentalis*) SC  
 Fall/late fall -run chinook salmon (*Oncorhynchus tshawytscha*) C  
 California tiger salamander (*Ambystoma californiense*) C  
 Western pond turtle (*Clemmys marmorata*) SC  
 Western burrowing owl (*Athene cunicularia*) SC  
 Tricolored blackbird (*Agelaius tricolor*) SC

**State\* Threatened (ST), Endangered (SE), Species of Special Concern (SSC), Fully-Protected (FP)**

Swainson's hawk (*Buteo swainsoni*) ST  
 Greater sandhill crane (*Grus canadensis tabida*) ST, FP

\*These species are state-only listed species, fully-protected species, and other California species of special concern that may or may not have federal status (see Table 1).

## 1.3 Critical Habitat

The project site does not include designated critical habitat for any terrestrial species listed above.

Four aquatic species (spring-run chinook salmon, winter-run chinook salmon, Sacramento splittail, and the Central Valley steelhead) have designated critical habitat within the project area. Critical habitat for Sacramento River winter-run chinook salmon includes the Sacramento River (including the river water and river bottom) and adjacent riparian zone (FR Vol. 58 No. 114). Critical habitat for Central Valley spring-run chinook salmon and Central Valley steelhead is designated to include all river reaches accessible to listed chinook salmon in the Sacramento River and its tributaries. Excluded are areas above specific dams (Camanche Dam) and above longstanding naturally impassable barriers (i.e. natural waterfalls in existence for at least several hundred years).

Only the fall run chinook is confirmed to occur in the upper Cosumnes River, but technically there is no barrier between the Sacramento and the upper reaches of Cosumnes, Badger and Laguna Creeks, so these areas may be considered critical habitat by NMFS.

## 1.4 Consultation to Date

- March 7, 2001. Informal consultation with Chris Nagano, USFWS regarding special status species listing.
- April 30, 2001 Consultation Letters to USFWS, CDFG, and ACOE regarding project scoping.
- July 17, 2001. Letter from CDFG responding to request for consultation and acknowledging need for 1600 permits and CEQA assessment.
- August 24, 2001, informal consultation with NMFS concerning potential impacts to winter-, fall/late fall-, and spring-run chinook salmon, Central Valley steelhead, critical habitat
- December 11, 2001, informal consultation with Madelaine Martinez of NMFS regarding potential project impacts and need for mitigation.
- January 11, 2002. Letter from USFWS commenting on AFC for project.
- January 17, 2002. Letter from Applicant to USFWS responding to concerns of January 11, 2002 and requesting meeting.
- February 7, 2002 Pre-consultation meeting with ACOE, USFWS, (CEC was also present) pre-consultation meeting to brief ACOE, USFWS about project. Invited participants CDFG and NMFS did not attend. Objective was to identify permit requirements application requirements and appropriate mitigation for project.
- February 20, 2002 Revised Species List for the Cosumnes Power Plant Gas Pipeline sent to Debra Crowe from Harry Mossman.
- April 5 and 8, 2002, Keith Whitener, The Nature Conservancy, Cosumnes River Preserve fisheries biologist, discussions of potential impacts to fish in Cosumnes River and Badger Creek from wastewater discharge and construction of pipeline through preserve.
- April 5, 2002, Mike Eaton, Cosumnes River Preserve Manager, discussion to determine potential impacts to Cosumnes Preserve from Project.
- May 10, 2002 Progress meeting with Ken Fuller, USFWS concerning wetland mitigation and presentation of final pipeline alignment.

## 1.5 Current Management Direction

A portion of the CPP natural gas pipeline project is proposed to go through the Cosumnes River Preserve in Sacramento County. The Cosumnes River Preserve is jointly owned by The Nature Conservancy, Bureau of Land Management, Ducks Unlimited, CDFG, Sacramento County Department of Regional Parks, Recreation and Open Space, and California Department of Water Resources (DWR). The overall goals of the Preserve are to restore riparian habitat in the Cosumnes River watershed and to protect and maintain habitat for native plants and wildlife.

## 1.6 Description of the Proposed Action

CPP will consist of a nominal 1,000 megawatt (MW) combined-cycle natural gas-fired power plant. The plant will be constructed in 2 phases, each consisting of 500 MWs. Each phase will have 2 combustion turbines, one condensing steam turbine, and 2 heat recovery steam generators (HRSGs). Construction of CPP will require that 30 acres of annual grassland be leveled and elevated for the CPP footprint, an access road, and a 1.5-acre stormwater detention pond located within the 30-acre parcel (Figure 2). These features will result in the permanent loss of annual grassland that includes seasonal wetland and vernal pool habitats. Preparation of the CPP site also requires permanent realignment of two intermittent swales. The swales currently run from south to north through the center of the site, primarily flow only during the rainy season, and will be realigned to the west and east sides of the site, where meandering flow will join with Clay Creek to the north of the site.

The CPP project will include the following associated features:

- A stormwater detention basin and discharge outfall structure to Clay Creek are located in the northwest corner of the CPP site. Construction of the 200-foot-long stormwater discharge pipeline would result in temporary disturbance to 0.3 acre of pasture, annual grassland, and seasonal swale within the 30 acres. The open-cut trench method would be used to construct the stormwater discharge pipeline.
- A new double circuit 0.4-mile long 230-kV transmission line will extend north northeast from the proposed switchyard at the CPP site to the existing Rancho Seco Plant's 230-kV switchyard. Approximately 6 new steel pole transmission towers will be required.
- Natural gas for the facility will be delivered via a new 24-inch-diameter pipeline extending 26.5 miles from SMUD's existing transmission backbone pipeline network that currently terminates at the Carson Ice-Gen Facility in Elk Grove. Two compressor stations will also be required, one at Carson the other in Winters. Construction of the natural gas pipeline would require 2 construction methods, the conventional open-cut trench method, horizontal directional drill (HDD), and jack-and-bore. The open-cut trench method requires a 35 to 75-foot wide construction zone that includes area for an 8-foot-wide, 8-foot-deep trench, separate topsoil salvage and trench spoil piles, and vehicle/equipment access along the entire alignment. The HDD method would be used to install the natural gas pipeline under the Cosumnes River, Badger Creek, portions of the Cosumnes Preserve, and Highway 99. The HDD may require the use of a bentonite lubricant during the drilling process. Bentonite is a non-toxic clay material often used in farming and wetland construction. Jack-and-bore is used for crossing under small obstacles such as roads and railroad tracks, and consists of digging two pits and using a hydraulic jack to bore the pipe underneath the obstacle.
- Two new natural gas compressor stations will be constructed as part of CPP's Phase 2 activities. One will be located at the Carson Ice-Gen site at an existing valve station. The other compressor station will be added to an existing interconnection facility in Winters, California where the SMUD pipeline ties-in to PG&E's main backbone Line 400. Both sites are already fenced and gravel lined. They will not require enlargement. An acoustical enclosure may be constructed at the sites to reduce noise levels.
- Water for cooling will be supplied by a new 0.3-mile pipeline connection to the existing 66-inch diameter water line that already conveys water from the Folsom-South Canal. It will require a 75-foot-wide construction corridor resulting in temporary disturbance to 1.3 acres of pasture, annual grassland, and seasonal swales.
- Industrial wastewater from the plant will be discharged to Clay Creek in accordance with NPDES discharge requirements. The 200-foot-long wastewater discharge pipeline



to Clay Creek would result in temporary disturbance to 0.3 acre of pasture, annual grassland, and seasonal swale.

- Domestic water and process makeup water will be supplied by diverting a portion of the cooling water from the Folsom-South Canal to a package treatment plant.
- A temporary 20-acre construction laydown area would be located in annual grassland immediately south of the CPP site, south of Clay East Road. Two swales that run through the laydown area will be permanently rerouted to connect with the realigned swales at the CPP site. The laydown area will be restored to annual grassland after construction is complete.

## 1.7 Action Area

The action area for the CPP project includes the Cosumnes River watershed and Central Valley. The Central Valley contains habitat for large numbers of migratory birds that winter in the cultivated agricultural fields, pastures, and Sacramento-San Joaquin delta areas. The Central Valley contains a wide variety of vegetation communities that support special-status plants and wildlife. Vegetation communities in the project area include annual grasslands with swales and seasonal wetlands, grazed pastures, cultivated agricultural land, wetlands, and cottonwood, Valley oak, and willow riparian habitats. Wetlands and waters of the U.S. include vernal pools, intermittent and perennial streams (Clay, Badger, and Laguna creeks), swales, and the Cosumnes River. Portions of the natural gas pipeline are within residential and commercial areas in the cities of Sacramento and Elk Grove.

A portion of the Cosumnes River and Cosumnes River Preserve are included as part of the action area. The Cosumnes Preserve was developed to protect the natural river ecosystem including riparian and freshwater marsh habitats. The Preserve maintains one of the last remaining valley oak riparian forests in California and portions of the Preserve have been selected as a national Natural Landmark. The Cosumnes River is one of the last rivers in California without dams, it routinely overflows its banks and provides sediments and nutrients to adjacent flood plains, riparian habitats, and wetlands. Portions of the Cosumnes Preserve is managed by the CDFG and other portions by The Nature Conservancy.

The CPP project will result in direct and indirect impacts to biological resources within the action area. These impacts include temporary and permanent disturbance to Central Valley habitats and wildlife. The CPP project impacts area will temporarily affect approximately -- acres and permanently convert 30 acres of habitat within the Central Valley to industrial use.

## 1.8 Time Line and Implementation Schedule

SMUD expects to begin construction of the CPP facility in the first quarter of 2003 and begin operation of Phase 1 in 2005. The natural gas pipeline construction would encompass 2 dry seasons, between spring of 2003 and summer 2004, when low water flows are expected in the Cosumnes River and tributaries, and to reduce potential environmental impacts to aquatic species. The CPP would have an operational life of approximately 30 years and would operate 7 days per week, 24 hours per day.

## 2.0 Special-Status Species Accounts and Status in the Action Area and Project Effects

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The designation of special-status includes: federal- and state-listed species under either the Federal or the California ESA, species proposed for those listings, federal Species of Concern, California Species of Special Concern, California Fully-Protected Species under the Fish and Game Code, and plant species designated as rare, threatened, or endangered by the California Native Plant Society (CNPS). A comprehensive list of special-status species that could occur in the project area is included in Table 1. Special-status species whose habitat(s) and distribution is present within the CPP project area are addressed in this section and evaluated for project impacts and mitigation. Other special-status species that were included on the USFWS, CDFG, and CNPS lists whose habitats or known boundaries of distribution do not occur within the project area are included in Table 1 and evaluated in Section 2.1 but not evaluated for project impacts and mitigation.

Field surveys that focused on habitat suitability and searches for special-status species were conducted on the entire CPP site, within a mile of the site, and 2,000-foot corridor along the gas pipeline and electric transmission line alignments. Botanical surveys for special-status plants focused on the proposed construction disturbance areas. Figures 5 through 9 show locations of known species occurrences.

Indirect and direct permanent, temporary, and operational project effects were analyzed for impacts to special-status species from the CPP project. Proposed protection and mitigation measures for impacts to special-status species are presented in Section 5. Tables 2, 3 and 4 provides a summary of these potential impacts to the native vegetation communities in the project area resulting from the construction and operation of CPP and associated linear facilities.

### 2.1 Species Known or Assumed to Occur in the Project Area

Special-status species known to occur or are assumed to occur in the project area were identified through informal consultation with USFWS and CDFG, discussions with The Nature Conservancy regarding the Cosumnes River Preserve, and field surveys for the project. The species addressed in this BRA are dependent in some way on aquatic habitats such as river, creek, vernal pool, emergent marsh, or on the adjacent riparian habitats. The following sections discuss the potential impacts to special-status species from the CPP project.

#### 2.1.1 Federal Listed Species

##### 2.1.1.1 Sacramento Orcutt Grass

The Sacramento orcutt grass (*Orcuttia viscida*) is a Federal and state endangered and CNPS 1B species. It is an annual herb that occurs in vernal pool habitats, blooming from May to June after pools dry. CNDDDB records show historic occurrences of Sacramento orcutt grass approximately 2 miles from Rancho Seco. This species is seriously threatened by agriculture, urbanization, and grazing where vernal pools are lost or degraded (Skinner and Pavlik,

1994). Initial surveys for this species were done in conjunction with the wetland delineation for the project and specifically for the project site by Davis Environmental Consultants (Davis 2001). Additional surveys were conducted during the blooming period. The CPP project is not expected to affect the Sacramento orcutt grass.

#### **2.1.1.2 Vernal Pool Tadpole Shrimp and Fairy Shrimp**

Vernal pool tadpole shrimp (*Lepidurus packardii*), a federal endangered species and vernal pool fairy shrimp (*Branchinecta lynchi*), a federal threatened species (collectively referred to as vernal pool branchiopods) are California endemic species, live their entire life cycle in temporary pools that fill with rainwater. They occur in ponding areas such as vernal pools, swales, seasonal wetlands, or depressions that hold water for at least 2 weeks during the wet season. They lay eggs (cysts) as the pool dries and persist in the encysted egg stage during the summer dry periods. These particular species are endemic to vernal pools and swales in California's Central Valley (Federal Register 1994a), but they are also known to inhabit scrapings, tire tracks and other artificial depressions (USFWS 1996). Where topsoil has been removed from the depression by grading or scraping, or where water is prevented from collecting, the population of fairy shrimp in that pool could be lost.

Suitable but degraded habitat exists for vernal pool fairy shrimp in the low depressions near or within the Union Pacific railroad right-of-way and Laguna-Stone Lakes Preserve along the gas pipeline and the vernal pool north of the CPP project site. Surveys for listed vernal pool branchiopods were not conducted specifically for the CPP project, as the USFWS indicated during informal consultation that protocol survey results showing absence would not be accepted. Vernal pool branchiopods are presumed to be present in the vernal pools and seasonal depressions at the site and along the gas pipeline alignment that hold water for a long enough period. As a practical matter, features that did not have water in February 2002 were considered to have unsuitable hydrology.

Construction of the CPP footprint may result in the direct loss of some ponding habitats. In addition, the gas pipeline construction corridor contains seasonal ponding areas that could support protected vernal pool species. The CPP project may adversely affect vernal pool tadpole shrimp, vernal pool fairy shrimp, and vernal pool plants that may occur in the wetlands. Mitigation is proposed for the loss of wetlands on the site (see Section 5.0).

#### **2.1.1.3 Conservancy Fairy Shrimp**

The Conservancy fairy shrimp (*Branchinecta conservatio*) is a Federal endangered branchiopod. Conservancy fairy shrimp inhabit relatively large vernal pools and are known from six disjunct populations in Tehama, Butte, Solano, Glenn, Merced, and Ventura counties (Federal Register 1994). This species is not known to occur in Sacramento County.

Reasons for decline of the Conservancy fairy shrimp include loss of vernal pool and other seasonal wetlands to farming and development. The mitigation measures proposed by the CPP project for other listed branchiopods species would compensate for any potential habitat lost for Conservancy fairy shrimp. The CPP project will not adversely affect Conservancy fairy shrimp.

#### **2.1.1.4 Valley Elderberry Longhorn Beetle**

The valley elderberry longhorn beetle (VELB) is listed as a federal threatened species. The VELB is dependent on its host plant, elderberry (*Sambucus* sp.). Adults feed on elderberry foliage and flowers.

The VELB requires the presence of mature elderberry plants to complete its 2-year life cycle. The animal spends most of its life in the larval stage, living within the stems of an elderberry plant. The adult stage is short-lived. Females lay eggs in crevices of the bark in

late June. The larvae normally occupy elderberry stems, trunks, and roots greater than 1 inch in diameter. Larvae and pupae remain in the stems for one to 2 years until emergence as adults in the spring. Adult emergence is from April through June, about the same time the elderberry produces flowers. External sign of the species on elderberry shrubs is limited to exit holes created by adults chewing their way out of the stems after pupation.

The VELB's range extends throughout California's Central Valley and associated foothills. Waterways that drain to the Sacramento-San Joaquin delta and support elderberry plants are considered habitat for VELB. Sacramento County is included in the list of 31 counties that have VELB in all or portions of their areas.

Four isolated clumps of blue elderberry (*Sambucus mexicanus*) are located along the gas pipeline alignment near Elk Grove Boulevard. These will be avoided by construction. The riparian habitats of the Cosumnes River Preserve may also support elderberry shrubs. The riparian habitats of the Cosumnes Preserve, including elderberry plants, will be avoided by using horizontal directional drill (HDD) to place the gas pipeline under sensitive areas. If a frac-out (e.g. inadvertent returns of drilling mud enter the waterway through a fissure or crack in the soils) were to occur from HDD, the elderberry shrubs would most likely not be affected, as clean up of the drilling mud would not remove shrubs. The CPP project may affect, but will not adversely affect VELB.

### 2.1.1.5 Special-Status Fishes

#### Chinook Salmon

The **winter-run chinook salmon** (*Oncorhynchus tshawytscha*) is a Federal and state endangered species. The **spring-run chinook salmon** (*Oncorhynchus tshawytscha*) is a Federal proposed endangered species.

The Cosumnes River historically supported runs of chinook salmon but since 1987 there were 3 years of no flow during the spawning period that precluded a continual natural run of salmon (USBR 1997). The lower reach of the Cosumnes River is tidally influenced approximately 25 yards upstream from the confluence of Laguna Creek. Most years the mainstem of the Cosumnes River has no flow upstream of Laguna Creek during the dry season (Whitener 2002). Fall-run chinook salmon may migrate up the Cosumnes River when the river begins to flow again after a series of rain events in November. The river can fill as early as mid-October and as late as mid-December, and some years it does not fill at all (Whitener 2002). Downstream emigration of young would occur during the period when water is in the river and when temperatures are appropriate, primarily March and April (Whitener, 2002, Moyle et al, 1995). Flows dry up in much of the river from June to August (Whitener 2002).

Reasons for decline in populations of chinook are due primarily to water diversion, pumping, groundwater withdrawals and poor water quality management, loss of spawning grounds, and impingement and entrainment of juvenile fish.

The CPP project will not create a barrier to immigration of spawning salmon or emigration of juvenile salmon due to water diversion from the Cosumnes River. The CPP water supply for cooling will come from the Folsom South Canal originating at Lake Natoma, through a new extension of the existing 66-inch diameter, underground pipe that supplies the Rancho Seco plant. Water diverted from the American River system for the CPP project falls under a water rights contract between the U.S. Bureau of Reclamation (USBR) and SMUD. Impacts associated with USBR contracts are addressed through one or more Biological Opinions between the USBR and the USFWS.

CPP cooling water effluent will be discharged to Clay Creek under a National Pollution Discharge Elimination System (NPDES) permit issued by the Regional Water Quality

Control Board (RWQCB). The permit would require monitoring of the effluent for chemicals of concern and temperature changes. Temperature of the discharge would not exceed 5 degrees Fahrenheit (°F) above the receiving water temperatures. No impacts to chinook salmon are expected from CPP cooling water discharges.

The natural gas pipeline would cross under the Cosumnes River just west of Highway 99 via HDD, and would more than 30 feet under the water channels to avoid impacts to water quality or fish habitat. The HDD construction is proposed to occur in the dry season from June through September when that portion of the river is dry (Note: typically the dry season extends through October; however, October 1 begins the hibernation period for giant garter snake and the HDD would be constructed outside this period as well).

During informal consultation with NMFS (NMFS 2001), they indicated critical habitat occurs in the project area for Sacramento River winter-run chinook salmon, Central Valley spring-run chinook salmon, and Central Valley steelhead. Critical habitat for winter-run chinook includes the Sacramento River and adjacent riparian zone. NMFS also indicated the project could affect fall/late fall-run chinook salmon and Essential Fish Habitat (EFH). As noted above, discharges from the project would be permitted according to NPDES requirements issued by the RWQCB to protect aquatic life. Construction on the gas pipeline would be planned to cross under the Cosumnes River during the dry summer months to minimize the potential for adverse impacts to water quality that could affect Chinook salmon.

### **Central Valley Steelhead**

The Central Valley steelhead (*Oncorhynchus mykiss*) Evolutionarily Significant Unit (ESU) is a Federal proposed endangered population. The Central Valley steelhead migrate through the Sacramento/San Joaquin river system and potentially up the Cosumnes River. Steelhead typically begin upstream migration from July through February with juveniles emigrating November through May (USBR 1997), but in the Cosumnes River, they would migrate when there is water in the river, typically at the same time as Chinook salmon (Whitener 2002). Reasons for decline of the steelhead are similar to Chinook salmon as stated above. Impacts to Central Valley steelhead are not expected to occur as for the same reasons described for Chinook salmon above.

### **Sacramento Splittail**

The Sacramento splittail (*Pogonichthys macrolepidotus*) is a Federal proposed threatened species. It is endemic to the Central Valley in California and is known to inhabit the Cosumnes River watershed, including Badger Creek, where flood waters provide suitable spawning habitat (Whitener 2002). Sacramento splittail primarily occur in slow-moving reaches of the main rivers and the Delta (Moyle 1976). Peak spawning occurs from March through May in sloughs and other shallow, slow-moving water habitats (Moyle 1976).

Reasons for decline in the populations of Sacramento splittail include water diversions, reduced Delta outflow, entrainment in diversions, adverse water quality, and loss of shallow water breeding habitats.

The CPP cooling tower effluent will be discharged to Clay Creek under a RWQCB permit that protects aquatic species. The natural gas pipeline is proposed to cross the Cosumnes River and Badger Creek but will be bored under the water channels to avoid the potential breeding and rearing habitats during construction. If a frac-out were to occur in splittail habitat, potential impacts to water quality and Sacramento splittail could occur.

Frac-out, or inadvertent return of drilling lubricant, is a potential concern when the HDD is used for constructing pipelines under sensitive habitats and waterways. The HDD procedure uses bentonite slurry, a fine clay material, as a drilling lubricant. Bentonite is

non-toxic and commonly used in farming practices. Benthic invertebrates, aquatic plants, and fish and their eggs can be smothered by the fine particles if bentonite is discharged to waterways that support these aquatic species. To mitigate the potential impacts of a “frac out,” a detailed Contingency Plan for HDD has been developed and is presented in Appendix C. The CPP project may affect, but is not likely to adversely affect Sacramento splittail.

### 2.1.1.6 Giant Garter Snake

The giant garter snake (*Thamnophis gigas*), a Federal and California threatened species, is one of the largest garter snakes in North America. It is olive to dark brown with pale yellow stripes running down the back and both sides. It is highly aquatic, requiring marsh habitat (including flooded rice fields). The snakes also require a consistent source of small fish, amphibians, or other aquatic prey species in slow moving sloughs, creeks, rivers, ponds, and irrigation canals. Giant garter snake habitat is defined as any wetland, canal, or slough suitable for foraging (containing fish and amphibians), and upland habitat is defined as areas within 200 feet of aquatic habitats (Hornaday 1997). The Cosumnes River, Badger Creek, and irrigated crops, canals, and associated upland areas support aquatic species that provide forage for giant garter snakes.

The Sacramento County rice production zone and the eastern portion of the Sacramento-San Joaquin river delta from the Laguna Creek-Elk Grove region south to Stockton supports populations of giant garter snake (Federal Register 1993, Thelander 1994). The CNDDDB has a record of giant garter snakes occurring in the large marsh at the confluence of the Cosumnes River and Badger Creek west of Highway 99, and another in a marshy ditch south of Arno Road just east of Highway 99. Cosumnes Preserve staff report giant garter snake occur in the preserve but Laguna Creek has not been surveyed.

Giant garter snakes hibernate in underground burrows in upland areas adjacent to aquatic habitats during the winter months, typically from November through March (USFWS 1999). During the hibernation period they are susceptible to earth moving activities while in underground burrows. The snakes are normally active (breeding or feeding) from early March through September but have been observed above ground as early as February and as late as October in some areas (Wylie 1997). For consultation purposes, the USFWS typically refers to the winter hibernation period as October 1 to May 1 as this is the period when most, if not all, snakes are in hibernation.

Reasons for population decline include loss of forage habitat in natural steams and wetlands and supporting upland habitat, disruption during basking and hibernation, direct loss of individuals through predation by native and introduced species, and degradation of water quality. The proposed action may result in temporary impacts to the giant garter snake during earth moving activities, such as construction of the CPP gas pipeline trench.

There is no suitable giant garter snake habitat at the CPP project site, and none was reported during field surveys for tiger salamander and other amphibians. Along the gas pipeline, giant garter snake are known to occur in the Cosumnes River, Badger Creek and are assumed to be present in any nearby tributaries with appropriate cover, hydrology and prey. Roads and railroads are believed to be effective barriers where the pipeline parallels a railroad berm or heavily traveled highway.

The portion of CPP gas pipeline extending through the Cosumnes Preserve could temporarily affect giant garter snakes or their habitat during HDD and/or trench construction activities. If a frac-out were to occur in giant garter snake habitat, potential impacts could occur if drilling mud fills shelter burrows used by snakes and trapping them.

To mitigate the potential impacts of a “frac out,” a detailed Contingency Plan for HDD has been developed and is presented in Appendix C.

### 2.1.1.7 Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is a Federal threatened species and state endangered species. They nest near large bodies of water in California at low elevations and require a continuous supply of fish and/or waterbirds for prey. The bald eagle builds a large stick nest in old growth tree stands with 40 percent canopy cover near a permanent water source. They do not generally nest near human disturbance. The nearest record for nesting bald eagles was reported in 1992 approximately 5 miles east northeast of Rancho Seco. The bald eagle winters in the Central Valley of California.

Bald eagle population declines have been attributed to pesticide use and to a lesser extent, direct loss of individuals due to shooting, electrocution and traffic. Through recovery efforts implemented since its listing under the Endangered Species Act, the bald eagle population has increased in the lower 48 states (Federal Register 1999.) The USFWS proposed to delist the species in 1999.

Impacts to wintering bald eagle could result from disturbance in winter roosts or collisions with the electric transmission line or HRSG stacks. The CPP project will not contribute to the pesticide load in the region. There are no known communal winter roosts in the project area. Design of a 230-kV transmission line with conductor spans greater than 6 feet would minimize the potential for electrocution. The CPP project may affect, but will not adversely affect the bald eagle.

## 2.1.2 State Listed Species

### 2.1.2.1 Swainson’s Hawk

The Swainson’s hawk (*Buteo swainsoni*) is a California threatened species and nests in the Sacramento Valley from April through September. They migrate in September and October to winter in Central and South America where they forage in agricultural fields and return to their breeding grounds in the Central Valley in March and April. They nest in riparian areas close to open grasslands and agricultural crops that support prey. Swainson’s hawks prey on large insects, small mammals, snakes, and other small reptiles and amphibians up to 10 miles from active nest sites (CDFG 1992).

Pesticide use in South America has contributed to the decline in Swainson’s hawk populations when the birds feed on contaminated insects (Stockton Record, March 15, 1996). The Swainson’s hawk is declining in California due to pesticide use on wintering grounds and loss of nesting and foraging habitat in the Central Valley.

Swainson’s hawks are sensitive to disturbance during nesting and CDFG recommends a 0.5-mile buffer between construction and active nests. There are several known and potential nest sites from 2001 surveys conducted by CDFG within 0.5 mile of the proposed gas pipeline (Gifford 2002), but none near the project site (see Figures 5 through 9). Potentially suitable nest trees occur along the gas pipeline route, around the reservoir east of the project site, and within the Cosumnes Preserve. A Swainson’s hawk could nest in any of these in any year. No Swainson’s hawks were observed foraging on the project site during field survey.

The proposed action will have no effect on the wintering grounds of the Swainson’s hawk. However, the proposed CPP project may impact the Swainson’s hawk through loss of foraging habitat (annual grassland on the CPP site) and potential disturbance to nest sites during the breeding season (March 1 through August 15) along the gas pipeline alignment.

Noise from construction of the CPP project features may cause disturbance to nesting Swainson's hawks if active nest sites are within 0.5 mile of construction areas.

In general, construction of the pipeline will avoid the Swainson's hawk nesting season (March to August). In locations where this is not practical, preconstruction surveys will be conducted to determine if there are any active nest sites within 0.5 mile of construction areas.

Impacts to Swainson's hawk could also occur from collisions with the electric transmission line or HRSG stack. Protection and mitigation measures for Swainson's hawk is presented in Section 4. With implementation of these measures, the CPP project may affect but is not likely to adversely affect Swainson's hawk.

#### **2.1.2.2 Greater Sandhill Crane**

The greater sandhill crane (*Grus canadensis tabida*) is a California threatened and Fully-Protected species. It breeds in Siskiyou, Modoc, Lassen, Plumas, and Sierra counties during the summer, nesting in remote wetlands and shortgrass prairies. Sandhill cranes winter in the Cosumnes River Preserve from approximately September 15 to March 15 of each year. They occur in large flocks on the preserve, and fly out daily to surrounding farmland to feed. They were observed on the parcels east of the Cosumnes River proposed for the pipeline construction during early spring of 2002. They arrive at the Cosumnes in September and October and returns north in early spring. The CPP pipeline is within the sandhill crane migratory route.

Greater sandhill crane populations have declined because of loss of nesting habitats, loss of winter forage habitats, and direct mortality due to collisions with man-made structures. Sandhill cranes are generally absent from the area where new transmission lines and the stacks would be, so the risk of collision is low.

Pipeline construction in the vicinity of waterways is generally planned for the dry months to avoid adverse impacts to water quality and to avoid the period when sandhill cranes are present in the area. However, to the extent there could be some overlap in construction activities, there would be no construction in the rice fields and the Cosumnes Preserve within 5 miles of Interstate 5 (which is the greatest concentration area) and from one day to the next, construction would proceed slowly south. Sandhill cranes would temporarily avoid the immediate vicinity of construction for a distance of approximately 0.25 mile, but would be able to use that area after construction has passed through. Sandhills are strong fliers and use the Central Valley as far south as Stockton and as far north as south Sacramento. There is ample area for these birds to forage during construction, if both occur contemporaneously. No wintering forage habitat (rice fields and row crops) or nesting habitat will be lost for these species from the proposed action. The CPP project may affect, but is not likely to adversely affect greater sandhill crane.

#### **2.1.1.3 American Peregrine Falcon**

The American peregrine falcon (*Falco peregrinus anatum*) is a California endangered species. It was delisted as a Federal endangered species in 1999. It usually breeds in woodlands, forests and coastal habitats near wetlands, rivers, or lakes. They nest on protected cliffs and ledges for cover, and occasionally use tree cavities and tall buildings for nest sites. American peregrine falcon are not known to nest in the CPP area but may use the Central Valley as winter foraging habitat, feeding on small birds. The CPP project area and Cosumnes Preserve contains suitable winter foraging habitat.

Reasons for the decline of the peregrine falcon are pesticides, and loss of nesting and hunting (foraging) habitat. The proposed action will not contribute to the pesticide load in the region, no nesting habitat will be lost, and only minor wetland losses (foraging habitat)



will occur. Impacts to wintering American peregrine falcon could occur from collisions with the electric transmission line or heat recovery steam generator (HRSG) stack. The CPP project may affect, but is not likely to adversely affect peregrine falcon.

### 2.1.3 Non-Listed Species of Concern

#### 2.1.3.1 California Hibiscus

The California hibiscus (*H. californicus*) or rose mallow (*Hibiscus lasiocarpus*) is a CNPS list 2 species. It is not currently a Federal or state listed species. California hibiscus is restricted to mesic, warm, low elevation sites, typically in riparian settings. California hibiscus is known to occur within the Cosumnes Preserve.

Reasons for decline of this species include development, agriculture, channelization of the rivers, and loss of wetlands (CNPS 1994, CDFG 1984). The natural gas pipeline route will avoid potential habitat for California hibiscus in riparian areas by using HDD.

Potential impacts to individual hibiscus plants could occur if a frac-out were to occur where this species is located. Drilling mud (bentonite) could temporarily cover plants. The hibiscus is a perennial and would most likely recover from the temporary impact in the next season. The CPP project may affect but is not likely to adversely affect California hibiscus.

#### 2.1.3.2 Legenere

Legenere (*Legenere limosa*) is a CNPS list 1B species that occurs in southern Sacramento and northern San Joaquin valleys. It requires moist ground in vernal pools, lakes, ponds, and sloughs (Nakamura and Kierstead-Nelson 2001). Legenere is an herbaceous annual that blooms May to June after the pools are dry. Flowers are white to yellow. Legenere is threatened by grazing and loss of habitat by development.

Legenere occurs near the CPP pipeline construction corridor. A large vernal pool north of Arno Road and Highway 99 supports an abundance of this species (Marty 2002). In 2000, legenere covered 75% of the pool bottom.

The CPP project is proposes to avoid the vernal pool at Arno Road by placing the pipeline on the south side of Arno Road. The CPP is not likely to adversely affect legenere.

#### 2.1.3.3 Fall and Late Fall-Run Chinook Salmon

The fall and late fall-run chinook salmon (*Oncorhynchus tshawytscha*) are Federal candidate species for listing. Fall-run chinook salmon spawn in the Cosumnes River and may overlap with other runs of chinook. Adults migrate from the Pacific Ocean from October through February (Moyle et al 1995). Spawning extends from October through December with peak spawning in October and November. Currently, the average number of fall-run chinook migrating up the Cosumnes River is 100 fish (USBR 1997).

Reasons for decline in the populations of fall-run chinook include inaccessibility of spawning grounds due to water management projects, unscreened agricultural diversions, overfishing, high water temperatures, and poor water quality (USBR 1997). The natural gas pipeline will cross the Cosumnes River by HDD but will be bored under the water channel when the Cosumnes River and Badger Creek are dry to avoid the potential migration routes during construction.

The CPP cooling tower effluent will be discharged to Clay Creek under permit from the RWQCB to ensure that water quality does not adversely affect special status species downstream. The CPP project will not adversely affect fall and late fall-run chinook salmon.

#### 2.1.3.4 California Tiger Salamander

The California tiger salamander (*Ambystoma californiense*) (CTS) is a federal Candidate species and California Species of Special Concern. CTS is known from the San Francisco Bay area, the San Joaquin Coast Ranges, the Central Valley from Yolo County south to Kern County, and the mountains and foothills of Santa Barbara and San Luis Obispo Counties, where it is found in annual grassland and oak woodland habitats (Zeiner 1988). They normally are not found in waterbodies that support predatory fish species such as bass, catfish, and trout, as the fish will prey on CTS larvae. Other habitats include permanent ponds, slow moving streams, vernal pools, and other seasonal ponds that hold water for 4 to 6 consecutive months below 1,000 feet in elevation for breeding. Adults commonly use ground squirrel burrows or cracks during aestivation (summer dormancy). CTS can travel 0.5 mile or more from aestivation sites to breeding ponds. Migration to breeding ponds occurs following warm winter and spring rains from October through May (Jennings 1994). CTS that use permanent ponds containing predatory fish or frogs as breeding habitat will most likely be unsuccessful as the larvae get eaten (CDFG 1999). CTS may require 2 or more years to become sexually mature and can live for 25 years or more.

CNDDDB records show historic occurrences of CTS along Twin Cities Road near Rancho Seco, and in Borden Ranch 1.25 miles south of Rancho Seco. CTS larvae were found in a constructed vernal pool approximately 0.25 mile east of Rancho Seco Reservoir in 2002 (Ellen Davis; Davis Environmental Consulting, personal communication). Dr. Mark R. Jennings (Rana Resources) conducted field surveys for CTS in the CPP project area in April 2002 but detected no CTS along the gas pipeline. Breeding habitat in these areas primarily consist of stock ponds, vernal pool, or other seasonal pools.

The CPP site does not contain suitable breeding habitat for CTS and none was found during field surveys (Jennings 2002). In general vernal pools along Arno Road, Twin cities and near the Cosumnes look potentially suitable. However, Jennings noted “the presence of abundant bullfrog populations ...severely restricts the ability of these species to successfully reproduce and survive in the restricted aquatic habitats available. Jennings further observed “extensive habitat degradation along the proposed corridor route, due to established roads (where animals can be run over), man-made canals, vineyards, feed lots, residential landscaping and other agricultural activities. The railroad right-of-way in survey area 4 [near Twin Cities road] was disturbed several times by individuals during the month of April by driving ATVs and other vehicles through vernal pools on both sides of the railroad tracks as they dried. Thus any organisms present in these pools are already being negatively affected by human activities.

The CPP project will not result in the loss of CTS breeding habitat and is not likely to adversely affect California tiger salamander.

#### 2.1.3.5 Western Pond Turtle

The western pond turtle (*Clemmys marmorata*) is a Federal Species of Concern and state Species of Special Concern. Western pond turtles require permanent or nearly permanent water, such as ponds, lakes, streams, or irrigation canals. Western pond turtles were observed in a perennial pond in the Cosumnes River Preserve immediately west of Highway 99 and in the concrete box culvert 0.25 mile northwest of the CPP site access road. They could also occur in Badger, Clay, Hadselville, and Laguna creeks and the Cosumnes River. In addition, stock ponds in the vicinity could support this species.

Reasons for decline of these turtles include loss of dispersion corridors, wetlands, and shallow, slow moving aquatic habitats. Avoidance of the habitats during construction of the natural gas pipeline by directional drilling underneath the waterways or keeping trench work outside open water areas is expected to eliminate direct impacts to pond turtles. The

CPP cooling tower effluent will be discharged to Clay Creek under an NPDES permit from the RWQCB. The CPP project may affect, but is not likely to adversely affect western pond turtles.

#### **2.1.3.6 Western Burrowing Owl**

The Western burrowing owl (*Athene cunicularia*) is considered a federal Species of Concern and a California Species of Special Concern. Burrowing owl habitat consists of open grassland or prairie with short vegetation and an abundance of mammal burrows. Burrowing owls prey on small mammals, insects, and crayfish, and can feed on carrion. Short vegetation may increase prey availability, enhance predator detection by the owls, and attract burrowing mammals that provide nest sites for burrowing owls. The species is typically migratory but may use burrows in the project area and along the pipeline both during the breeding season and winter.

Potentially suitable habitat occurs along the railroad tracks west of Franklin Boulevard, along Twin Cities Road, and at the project site. Burrowing owls tend to use the same burrows from year to year, such that the presence of burrowing owls usually indicates they will be back in following years. One owl pellet was reported adjacent to a burrow approximately 300 feet northwest of the proposed CPP site in 2001. No owls were observed on, or adjacent to, the project site during protocol surveys in May 1 and 3, 2002. Only one pair of owls was observed along the pipeline, located at Sims road in the Sacramento Regional Wastewater Plant bufferlands. Owls could potentially colonize any suitable squirrel burrows in any year, but presently there is no evidence of any owls along the pipeline corridor with the exception of the pair at Sims Road. The CPP project is not likely to adversely affect western burrowing owls.

#### **2.1.3.7 American Bittern**

The American bittern (*Botaurus lentiginosus*) is a Federal Species of Concern. The American bittern is found throughout the Central Valley most times of the year in tall emergent marsh habitats. It builds nests on the ground from reeds and grasses in dense marsh areas. It feeds on a variety of species, including fish, snakes, amphibians, invertebrates, crayfish, insects, birds, and small mammals. American bittern are known to nest and forage in Cosumnes Preserve, along irrigation canals, streams, ponds, and rivers in the project area. The water bodies with emergent wetland vegetation along the CPP pipeline area are suitable nesting habitat for the American bittern and the canals provide a variety of prey.

Reasons for decline of the American bittern include loss of emergent wetland habitats throughout California. Irrigation canals containing prey species and tall emergent vegetation found in agricultural fields are used as alternative habitat. Impacts to the American bittern from the CPP project include the potential for nest disturbance during construction near irrigation canals. Avoidance of the habitats during construction of the natural gas pipeline by directional drilling underneath the waterways or keeping trench work outside open water areas is expected to eliminate direct impacts to bittern. Preconstruction surveys will be conducted in the project disturbance areas for American bittern nest sites as well as other nesting species. The worker awareness training program will include instruction on avoidance of all nest sites in construction zones and notification procedures if nest sites are located.

#### **2.1.3.8 Grasshopper Sparrow**

The grasshopper sparrow (*Ammodramus savannarum*) is a Federal Species of Concern. It builds nests of grasses and forbs on the ground at the base of tall, dense grass clumps in open grasslands. The distribution of grasshopper sparrows includes the eastern portion of Sacramento County in its summer, nesting range (Zeiner 1990a, Peterson 1990). The

grasshopper sparrow occurs in Sacramento County as a winter migrant. The grasshopper sparrow is not known to nest in the project area.

Reasons for decline of grasshopper sparrow include loss of open grassland habitat from conversion to farming, houses, and other development. Impacts to nesting grasshopper sparrows are not anticipated from the CPP project; however, the worker awareness training program will include instruction on avoidance of all nest sites in construction zones. The CPP project is not likely to adversely affect the grasshopper sparrow.

#### **2.1.3.9 White-Faced Ibis**

The white-faced ibis (*Plegadis chihi*) is a Federal Species of Concern and California Species of Special Concern. It nests in small colonies in freshwater marshes, ponds and rivers in isolated areas in southern California, the Klamath basin, and the Central Valley. It feeds on crustaceans and other invertebrates in muddy emergent marshes and croplands. White-faced ibis are occasional visitors of the Cosumnes Preserve.

Reasons for decline of the white-faced ibis population include loss of wetlands used as nesting and forage habitats. Impacts to the white-faced ibis could occur from collisions with the electric transmission line or HRSG stack. The CPP project may affect, but is not likely to adversely affect white-faced ibis.

#### **2.1.3.10 White-Tailed Kite**

The white-tailed kite (*Elanus leucurus*) is a California Fully-Protected species. It is a year-round resident of the Central Valley, coastal range, and foothills. It is common in agricultural areas, feeding on small mammals, insects, birds, reptiles, and amphibians. It nests in riparian and/or isolated tall trees and shrubs near foraging areas. White-tailed kites are known to nest in the Cosumnes Preserve and could nest in trees near the site and along the gas pipeline alignment.

Reasons for decline of the white-tailed kite include loss of riparian nesting habitats and open forage areas. Impacts to the white-tailed kite could occur from collisions with the electric transmission line or HRSG stack. With implementation of protection measures, the CPP project may affect, but is not likely to adversely affect white-tailed kite.

#### **2.1.3.11 Special Concern Bats**

##### **Myotis Bats**

The small-footed myotis bat (*Myotis ciliolabrum*), long-eared myotis bat (*M. evotis*), fringed myotis bat (*M. thysanodes*), long-legged myotis bat (*M. volans*), and Yuma myotis bat are Federal and State Species of Concern. These bats roost in crevices, buildings, spaces under bark, and in caves in undisturbed areas (Zeiner, et al., 1990b). These species avoid the arid Central Valley, remaining in the foothills, feeding on insects and spiders over trees and water. Potential suitable habitat exists in the Cosumnes Preserve riparian corridor. The Cosumnes Preserve riparian corridor will be avoided with use of the HDD construction method for the gas pipeline. No impacts to these species of myotis bats are anticipated from CPP project activities as no potential roost structures or trees will be affected.

##### **Big-Eared Bats**

The Pacific western big-eared bat (*Plecotus townsendii townsendii*) and Pale Townsend's big-eared bat (*Plecotus townsendii pallascens*) are Federal and State Species of Concern. They are found throughout California and require caves and buildings or other structures for roosting. They are extremely sensitive to disturbances at roost sites (Zeiner, et al., 1990b). Big-eared bats hibernate during cold weather, from October to April. They feed on flying insects by gleaning from foliage. Potential suitable habitat exists within the Cosumnes Preserve riparian corridor. The Cosumnes Preserve riparian corridor will be avoided with

use of the HDD construction method for the gas pipeline. No impacts to bats are anticipated from CPP project activities as no potential roost structures or trees will be affected.

### **Greater Western Mastiff Bat**

The western mastiff bat (*Eumops perotis californicus*) is a federal Species of Concern and California Species of Special Concern. It prefers semi-arid to arid habitats, including annual and perennial grasslands. It roosts in crevices of rock outcrops and buildings (Zeiner, et al., 1990b). The western mastiff bat stays active all year long, going into daily torpor from December through February, and resuming feeding during the night. It forages up to 7 hours per night and does not retain night roosts like many bat species. Potential suitable habitat exists within the Cosumnes Preserve riparian corridor. The Cosumnes Preserve riparian corridor will be avoided with use of the HDD construction method for the gas pipeline. No impacts to bats are anticipated from CPP project activities as no potential roost structures or trees will be affected.

### **Pale Townsend's big-eared bat**

The Pale Townsend's big-eared bat is a Federal Species of Concern and California Species of Special Concern. This species requires caves, and buildings or other structures for roosting and is extremely sensitive to disturbances of roost sites (Zeiner 1990b). Suitable habitat exists within riparian areas in the Cosumnes Preserve area.

Reasons for decline of pale Townsend's big-eared bat include loss of breeding and roost habitat in areas with suitable habitat. No impacts to bats are anticipated from CPP project activities as no potential roost structures or trees will be affected.

## **2.2 Area of Disturbance**

Permanent and temporary surface disturbances were evaluated for the Central Valley habitats that could support special-status species. Table 2 presents the overall, total acreage of permanent and temporary surface disturbance used to evaluate mitigation requirements.

**TABLE 2.**

Total Area in Acres of Temporary and Permanent Surface Disturbance During Construction and Operation of CPP.

Feature	Size of Disturbance	Duration (if temporary)	Habitat Type	Temporary (acres)	Permanent (acres)
Project Site	Polygon		Annual Grassland with swales	NA	30
Site Construction Laydown	Polygon	32 months	Annual Grassland with swales	20	0
Site Construction Access Road	0.5 mile x 24' wide permanent, additional 0.5 mile x 25' for construction	12 months	Annual grasslands, wetland swales	1.5	1.5
Gas Pipeline	26 miles x 35' permanent easement [(26 x 5280 x 35)/ 43560]		Ruderal, roadside, annual grassland with vernal pools and other ponding	110	0
Gas Pipeline	26 miles x 30' construction width (in addition to 35' permanent easement listed above) [(26 x 5280 x 30)/ 43560]	22 months	Ruderal, roadside, annual grassland with vernal pools and other ponding	95	0
Gas Valving Stations	Two sites 50 x 50, one site 100 x 100		Ruderal, roadside, annual grassland, agricultural		0.34
Gas Pipeline Gas Compressor Stations	Two sites of 150' x 150' contained in existing fenced/ disturbed areas.		Fenced gravel area at existing interconnection		0
230-kV Transmission Line	Corridor 0.4 mile suspended lines, 150' wide temporary construction corridor	8 weeks	Annual grassland with swales, creek degraded vernal pools	7.3	
Transmission Tower Footprints	Six towers with 6' in diameter, permanent concrete footings.		Annual grassland		0.004
Water Supply	0.4 mile x 75' temporary construction width .	4 weeks	Annual grassland with swales, creek degraded vernal pools	3.7	0
Water Pump Station	(existing)				0
<b>Total</b>				<b>256</b>	<b>33</b>

**TABLE 3.**  
Summary of Wetland Areas within Temporary Pipeline Construction Area.

<b>Aquatic Features</b>	<b>Potential Jurisdictional</b>	<b>Non-Jurisdictional</b>
Agricultural Ponds	0.00	0.51
Agricultural Ditches	1.21	0.80
Creeks	1.16	0.00
Drainages	2.83	2.98
Intermittent Creeks	0.40	0.00
Marsh	0.95	0.00
Open Water	0.90	0.00
Pools	2.10	0.40
Swales	1.21	0.40
<b>Total</b>	<b>10.76</b>	<b>5.09</b>

**TABLE 4.**  
Wetlands and Other Waters of the United States that will be Potentially Impacted by the Proposed Construction Activities Associated with the Cosumnes Power Plant Project

<b>Location/ID</b>	<b>Project Feature</b>	<b>Type</b>	<b>Size (acres)</b>	<b>Data Source</b>
LD SW2	Laydown Area	Seasonal swale	0.021	CH2MHILL, 2002
LD SW3	Laydown Area	Seasonal stream	0.351	CH2MHILL, 2002
LD VP	Laydown Area	Vernal pool	0.152	CH2MHILL, 2002
VP9	Plant Site	Vernal pool	0.007	DEC, 2000
S8	Plant Site	Seasonal stream	0.063	DEC, 2000
SW9	Stormwater Detention Pond	Seasonal wetland/ degraded seasonal wetland	0.007	DEC, 2000
SW10	Stormwater Detention Pond	Seasonal wetland/ degraded seasonal wetland	0.033	DEC, 2000
SW12	Plant Site	Seasonal wetland/ degraded seasonal wetland	0.027	DEC, 2000
SW/SS13	Plant Site	Seasonal wetland/ degraded seasonal wetland	0.038	DEC, 2000
SS4	Plant Site	Seasonal swale	0.039	DEC, 2000
SM3	Plant Site	Seasonal marsh	0.299	DEC, 2000
East side of Plant Site	Access Road	Seasonal swale	0.084	JAS, 1993
Subtotal for seasonal swales, streams, marsh, and wetlands			0.962	
Subtotal for vernal pools			0.159	
<b>Total for all wetland areas and other waters of the U.S.</b>			<b>1.121</b>	

**Note:**

Wetland descriptions and areas taken from reports as referenced with the following exception. The JAS (1993) wetland crossings were mapped by JAS but the areas of potential impact were determined by field measurements taken by CH2MHILL personnel on May 29, 2002.

## 3.0 Cumulative Effects

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Some impacts associated with the CPP, which when considered in conjunction with impacts attributable to other projects (either in the vicinity or with similar characteristics), could have the potential to result in collectively adverse effects to the environment that are of greater significance than the individual impacts of the CPP project.

For purposes of this Biological Assessment, cumulative effects we use the definition at 50 CFR 402.02. That is, “. . . those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation.”

Non-Federal projects identified in the vicinity of the proposed action include:

- An application for biosolids storage on 3 parcels on the north side of Twin Cities Road (06/11/97), adjacent to and east of Clay Station Road. Mr. Gary Silva stores and applies biosolids to cattle pastures in this area.

Non-Federal projects identified in the vicinity of the proposed pipeline action include:

- An application to create two lots on the Buzdas property (9/25/00).
- An application to create a residential accessory dwelling (8/30/00).
- An application to create a residential accessory dwelling (Leonard no date).
- An application for Lakepoint Apartments –pending (no date)
- An application to rezone Park to “O” (1/27/99).
- An application from JDS Laguna Sub. Extension of Time (9/21/01).
- An application for RV and Boat storage use permit (12/31/97).
- An application for Harris ranch #1 – now City of Elk Grove recorded 4/4/2000.

With the exception of the biosolids storage, all these projects cover a small area (one lot to 10 acres) and would not cause loss of habitat for any animals at the project site or pipeline.

Biosolids applications north of Twin Cities Road would not cause any change in land use or habitat.

The CPP project is not anticipated to result in significant impacts related to biological resources. However, the CPP project would convert annual grassland habitat on the site to industrial development. This is the general trend in the Central Valley, and it incrementally reduces the value of habitat available to native wildlife species including migratory bird species.

The CPP project would also temporarily disturb habitat associated with construction of the linear CPP project components. This disturbance would result in the temporary reduction of habitat quality. Temporary activities could result in incidental death of wildlife and the disruption or failure of breeding efforts. Temporary disturbances would be mitigated by construction limits, environmental awareness training, biological monitoring, habitat compensation, and habitat restoration.

The project has the potential to increase slightly the risk for bird collisions with new electric transmission lines and towers within the Central Valley.



## 4.0 Direct and Indirect Effects of the Proposed Action

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Impacts to the species under discussion can be short-term (one or two reproductive seasons), or long-term (affecting several generations). They can be direct (an immediate affect to an individual, population or its habitat), or indirect (an affect that may occur over time or result from other actions).

### 4.1 Effects to Species

#### 4.1.1 Federal Listed Species

##### Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

Construction of the project site would permanently fill habitat or potential habitat for fairy shrimp and vernal pool tadpole shrimp. It would also directly and permanently fill vernal pools and seasonal wetlands that support fairy shrimp as listed in Table 5.

**TABLE 5.**  
Fairy Shrimp Habitat Directly Affected by Project Site.

Wetland Identification	Size (acres)
SW9	0.007
SW 10	0.033
VP 9	0.007
LDVP	0.152
Total	0.199

Indirect impacts to fairy shrimp habitat, defined according to the USFWS (1997) as changes in hydrology within 250 feet of project construction (including project site, laydown area, water supply line, transmission towers, stormwater detention basin and access road) totals 1.95 acres. (See Appendix B for a more complete discussion of how indirect impacts are quantified).

Pipeline construction would temporarily directly disturb 2.49 acres of vernal pools, degraded vernal pools, constructed vernal pools, railroad and roadside pools and non-jurisdictional pools that would be habitat for fairy shrimp. Trenching through vernal pools and similar fairy shrimp habitat would be a direct adverse affect on the fairy shrimp species. Indirect impacts to fairy shrimp habitat from pipeline construction, defined according to the USFWS (1997) as changes in hydrology within 250 feet of project construction are estimated at 6.96 acres. With additional field verifications, this area may be adjusted down slightly, but is the best current estimate.

The project site and pipeline were designed to avoid, to the extent feasible potential habitat for fairy shrimp and the relatively low area indicated here shows that the applicant was relatively successful at doing so. Previous studies for the SMUD Cogeneration Pipeline Project indicated that after gas pipeline construction, both vernal pool fairy shrimp and vernal pool tadpole shrimp had re-established themselves in 90 percent of pools in the right-of-way (Correspondence from SMUD to Wayne White May 30, 1997; ENV 97-168). Based on this information, it is reasonable to expect that most of the fairy shrimp habitat temporarily disturbed by construction will re-establish after construction. SMUD will compensate through preservation, restoration and construction for residual impacts as described in Section 5.0 below. The proposed action is likely to affect, but would not adversely affect continued existence of vernal pool fairy shrimp and vernal pool tadpole shrimp.

### **Valley Elderberry Longhorn Beetle**

There are no elderberry bushes on or near the project site. There are ten elderberry bushes along the pipeline construction corridor exclusive of any that occur within the Cosumnes River riparian corridor. Elderberry shrubs along the corridor would be flagged and avoided to prevent any adverse impact to valley elderberry longhorn beetles, if they occur there. The Cosumnes River riparian corridor will be avoided by using HDD methods. Therefore any elderberry shrubs that occur in the Cosumnes River riparian zone would be avoided unless there is an HDD “frac-out”. In the event of a “frac-out” the contingency plan included in Appendix C would be implemented to minimize and remediate for any adverse impact. Without the elderberry shrubs present in the project area, and by avoiding elderberry shrubs along the pipeline construction corridor, the beetle would not be directly or indirectly affected.

### **Spring-Run and Winter-Run Chinook Salmon, Sacramento Splittail, Central Valley Steelhead.**

There would be no direct impacts of any project feature on habitat or designated critical habitat or Essential Fish Habitat (EFH) for any listed fishes. The natural gas pipeline will cross the Cosumnes River by HDD under the water channel when the Cosumnes River and Badger Creek are dry to avoid adverse impacts to water quality that could affect listed fishes. Appendix C contains a preliminary Contingency Plan for HDD to avoid adverse impacts to fishes.

The CPP cooling tower effluent will be discharged to Clay Creek under NPDES permit issued by the RWQCB. The water quality criteria imposed on CPP will be determined using criteria such as the EPA Ambient Water Quality Criteria, such that adverse impacts to fishes would not occur. Stormwater runoff regulations require that construction activities of the nature of the project incorporated silt fences and other means to minimize runoff from the area of construction. All of the crossings of waterways, canals and ditches by the gas pipelines would use HDD or incorporate silt fences, wattles or other appropriate BMPs to avoid adverse impacts to water quality from stormwater runoff.

The CPP project will not adversely affect fall and late fall-run chinook salmon.

Avoiding degradation of the water quality would result in no direct effects to the chinook salmon, designated Critical Habitat, or other listed fishes of the Cosumnes River. There would be no indirect effects of the proposed action on fish species or designated Critical Habitat.

## **Giant Garter Snake**

The giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, other waterways and agricultural wetlands such as irrigation and drainage canals and rice fields, and the adjacent uplands. Essential habitat components consist of (1) adequate water during the snake's active period (i.e., early spring through mid-fall) to provide a prey base and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat; (3) upland habitat for basking, cover, and retreat sites; and (4) higher elevation uplands for cover and refuge from flood waters (USFWS 1997). The USFWS defines a disturbance areas for giant garter snake that may exceed project boundaries because a 200-foot radius (61 meters) from the edge of giant garter snake aquatic habitat is incorporated to include essential habitat components and determine potential take. Disturbance may be temporary and/or permanent and should consider: (1) opportunities to avoid habitat within the project area; (2) area of dewatering and period of time dewatered; and (3) temporary haul roads and equipment staging areas. The 200-foot radius (61 meters) also will be used to evaluate aquatic habitat disturbance during temporary alterations, i.e., upstream and downstream from berms placed for temporary dewatering.

USFWS defines temporary impacts as project activities which temporarily remove essential habitat components, but can be restored to preproject conditions of equal or greater habitat values. Projects which are to be considered temporary impacts must be able to implement the project and restore the affected habitat within two seasons (a season is May 1 to October 1).

There are no recorded records or suitable habitat for the giant garter snake on or near the project site and therefore no adverse effects are expected from this portion of the project. The CNDDB records GGS localities near Arno Road and Badger Creek (about 1.5 mile north of the pipeline), just south of Arno Road near 99 (1500 feet south of pipeline), west of Southern Pacific in Badger Creek/Horseshoe lake (800 feet SW of pipeline), and Franklin Blvd about 1 mile north of Core Rd (900 feet west of pipeline).

Based on these localities, a 200 foot buffer was drawn on either side of the pipeline construction corridor (65 feet wide), and any potential GGS habitat that comprised adequate water and vegetation was mapped using orthogonal photography and measured using GIS. The result was a combined area of 13.35 acres of disturbance area. There would be no permanent impacts to GGS habitat.

Trenching for the gas pipeline in the vicinity of the Cosumnes and Badger Creeks could potentially disturb or injure giant garter snakes during construction. Implementation of avoidance and mitigation measures specified below would reduce those impacts. Impacts would result only during construction and would be temporary. The proposed action is likely to adversely affect giant garter snakes. Mitigation measures would reduce those impacts such that the giant garter snake would not be adversely affected.

## **Bald Eagle**

Bald eagles may occasionally forage in the project area, and are known winter migrants in the area. There are no records of nests within 1 mile of the project or pipeline. Bald eagles could be injured or killed by collision with transmission lines or HRSG towers of the project. Designing transmission lines to APLIC standards for "raptor-proofing" would reduce impacts. The proposed action would not adversely affect bald eagles.

## 4.2 Federal Candidate and Special Concern Species

### Legenere

Legenere is not known from the project site or vicinity. A large population is known from a vernal pool complex north of Arno Road, east of Highway 99. The construction corridor was revised during scoping to be on the south side of Arno road specifically to avoid this sensitive area. With the construction corridor on the south side of Arno road, the proposed action would cause no adverse impacts to legenere.

### California Linderiella

California Linderiella is not known to occur on the project site, but is likely to occur in the vicinity and in any fresh water habitats (vernal pools, seasonal swales, railroad ditches) suitable to support fairy shrimp. As noted above, the project site and pipeline corridor have been selected to minimize potential impacts to these aquatic species and the construction corridor was revised during scoping to be on the south side of Arno road specifically to avoid sensitive area for this and other vernal pool species. With the mitigation and compensation measures specified in Section 5.0 for vernal pool fairy shrimp and vernal pool tadpole shrimp, the proposed action would affect, but would not adversely affect California linderiella.

### Fall/late fall-run chinook salmon

As noted above, there would be no direct impacts of any project feature and habitat on designated critical habitat or EFUs for any listed salmon. The natural gas pipeline will cross the Cosumnes River by HDD under the water channel when the Cosumnes River and Badger Creek are dry to avoid adverse impacts to water quality that could affect listed fishes. The same mitigation measures listed in Section 5.0 to protect salmon and other listed fishes will be equally effective in protecting fall/late fall-run chinook salmon. The proposed project is unlikely to affect fall/late fall-run chinook salmon.

### Western Pond Turtle

Western pond turtle occur in the perennial portion of Clay Creek north of the project site, and seasonally move into other ponds and water in the area. Western pond turtle also occur in and near the fish ponds along Arno Road, in the Cosumnes River, Badger Creek and Laguna Creek along the pipeline. Construction in or close to these waterways would potentially crush or kill western pond turtles. Except for egg laying, turtles tend to remain in perennial water. Construction near water is proposed to occur during the dry season to avoid potential adverse impacts to water quality and animals that depend on water quality, including turtles. The careful siting of the project site and pipeline avoiding most aquatic features, the use of HDD to cross under the Cosumnes River and Badger Creek, environmental awareness training and monitoring would reduce impacts to western pond turtles. The proposed project may affect, but is unlikely to adversely affect western pond turtle.

### Western burrowing owl

Habitat on the project site and along the pipeline corridor appears suitable to support foraging uses by western burrowing owl. Surveys during 2002 did not detect any nests on the project site. One pair of owls was observed near the pipeline construction corridor at Sims road, in the Sacramento Regional Wastewater Plant Bufferlands.

### Tricolored Blackbird

Tricolored blackbirds are known to forage on the project site south of Rancho Seco, although the nesting location appears to be somewhere over the hills south of the project. There are

no known nesting sites on the project site or within 0.2 miles of the proposed pipeline. The proposed project would reduce incrementally the available foraging habitat for this species of concern. Through consultations with CDFG and field surveys, the project will avoid modifying any tricolor blackbird nesting habitat. The proposed project would affect, but is not likely to adversely affect tricolored blackbird.

## 5.0 Mitigation and Protection Measures

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Impacts to special-status plants and wildlife from construction and operation of the CPP project include direct but temporary habitat disturbance, permanent habitat loss, and potential nest disturbance. Mitigation measures were developed through informal consultation with the USFWS, CDFG, and USACE. The following sections present protection measures found to be effective in avoiding and minimizing impacts to special-status species, construction timing restrictions, and habitat compensation for permanent loss of habitats.

### 5.1 Summary of Mitigation Measures for Construction Impacts

A summary of the mitigation measures for the CPP project is presented in Table 6. Additional detailed mitigation measures are presented in the following sections for each special-status species affected by the CPP project.

**TABLE 6.**  
Summary of Mitigation Measures for Impacts to Sensitive Biological Resources Within the CPP Project Area.

Biological Resource	Mitigation Measures
<b>Habitats</b> Annual grassland Crop land Wetlands	<b>Minimize impacts through:</b> Habitat restoration: Long-term monitoring Recontour topography of potential fairy shrimp habitats.
<b>Plants</b> California hibiscus	<b>Avoid and minimize impacts through :</b> Proper siting Salvage and transplant if in construction zone
<b>Wildlife</b> Tadpole shrimp Fairy shrimp Valley elderberry longhorn beetle Salmon, steelhead, and splittail Tiger salamander Giant garter snake Swainson's hawk Sandhill crane Burrowing owl Nesting and migratory birds	<b>Protection and Mitigation Measures:</b> Avoid habitat where practical Off-site habitat compensation for temporary and permanent impact Preconstruction surveys and avoidance On-site biological monitors Worker environmental awareness training Avoid burrows where possible Construct HDD under waterways from July through September Nest avoidance and tree removal from October to February Constrain construction schedule appropriately Salvage and relocate individual wildlife Slope trenches to allow wildlife to escape

#### 5.1.1 General Protection and Mitigation Measures of the CPP project

Many of the potential impacts to biological resources would be avoided through implementation of general conditions that guide good work practices. The following measures would be implemented for all project impact areas. These measures would help to avoid and minimize incidental mortality and injury to plants and wildlife. The CPP project would:

1. Prepare a Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP) that outlines how the protection and mitigation measures will be

implemented. The BRMIMP is a document required by the CEC that also describes the responsibilities of the Compliance Manager who oversees all compliance measures required for the project, the Designated Biologist who will oversee compliance with biological mitigation measures, and the Biological Monitor who oversees construction activities on the ground. The Designated Biologist submits daily logs and monthly compliance reports to the CEC. Any necessary monitoring reports are submitted to the CEC and relevant agencies.

2. Provide worker environmental awareness training for all construction personnel that identifies sensitive biological resources that may occur in construction areas and that addresses measures required to minimize project impacts during construction and operation.
3. Implement preconstruction surveys and resource relocation, if necessary, for sensitive species in impact areas prior to beginning ground disturbing activities. Biological monitors would be present onsite during all construction activities in sensitive habitat to identify sensitive resources and provide relocation as necessary.
4. Avoid and minimize impacts to sensitive habitats and species during construction by designating exclusion zones with fencing and/or signage that restricts disturbance to minimal area.
5. Provide mitigation construction monitoring by qualified biologists during construction activities near sensitive habitats and resources and prohibit ground disturbance until area is cleared by the biological monitor.
6. Prepare a Mitigation Monitoring Plan that outlines how SMUD would implement and monitor the mitigation measures and thus ensure that the proposed actions have minimal effects on biological resources.
7. Require that construction activities be limited to existing roads, access points, and construction zones developed in coordination with qualified biologists as specified in final approved construction plans and documents. Prohibit ground disturbance until cleared by the biological monitor. Where possible along linear pipeline alignments, use the alignment itself as the access route. Prohibit access to construction zones from off-road routes. Prohibit off-road traffic outside designated project areas.
8. Allow only permitted, authorized vehicles that have been inspected to ensure fire safety requirements on the construction sites; equip vehicles with catalytic converters with shielding or other acceptable fire prevention features.
9. Prohibit camping, firearms, trash-burning fires, warming fires, or pets in the construction zone at any time.
10. Monitor construction sites daily to pick up trash and litter. Place all food-related trash and litter in closed containers and dispose of daily.
11. Prohibit refueling or storage of hazardous materials within 200 feet of flagged sensitive plant species or sensitive wildlife habitat features (den, burrows, etc.), and within 100 feet of "waters of the U.S." or waters of the state. For portable equipment that use fuels or lubricants, use Visqueen or other containment material under the equipment to capture leaks or spills.
12. Prohibit intentional killing or collection of either plants or wildlife at construction sites.
13. Prepare construction monitoring and compliance reports that analyze the effectiveness of the mitigation measures.
14. Open trench work requires special attention in sensitive wildlife areas. A qualified biologist would be present during construction activities in suitable sensitive species

habitat areas for the purpose of clearing, removing, salvaging, or excluding additional individuals from the construction area. To minimize mortality in pipeline trenches, egress ramps will be constructed at either end of the open trench to allow wildlife escape routes. Where feasible, open trenches would be covered at the end of each construction day; where this is not feasible because extensive or wide open trenches are exposed, open trenches would be surveyed prior to the start of construction each morning by qualified biologists for the purpose of capturing and removing any trapped wildlife.

## 5.2 Timing Restrictions During Construction

The following timing restrictions and acceptable work windows for construction in sensitive areas (see Table 7) were developed by the natural resource agencies to avoid and minimize impacts to special-status species. Note that some areas of the project will be required to postpone activities until the appropriate times. In addition, there could be small work windows where 2 or more species have overlapping windows.

**TABLE 7.**  
Established Work Windows for Special-Status Species in the CPP Project Area.

Species name	Possible Location (mile post)	Active Period	Preferred Biological Construction Window
Vernal pool crustaceans	At CPP site and along gas pipeline	November to April	May through October
Valley elderberry longhorn beetle	MP 0.1 – 3 Any elderberry tree locations	Spring to Fall	January through December
Chinook salmon and steelhead	Cosumnes River and tributaries	November to June	July through October
Sacramento splittail	Cosumnes River and tributaries	December to July	August through November (dry season)
California tiger salamander	Farm ponds in south county area that persist for more than 12 weeks.	April to October	November through March in known locations
Giant garter snake	MP 12 to 14.5, Cosumnes River and Preserve, Badger and Laguna Creeks	May to October	March 1 through September 30
Western pond turtle	MP 3.8 UPRR & Franklin Rd crossing	April to October	November to March
Swainson's hawk	MP 12 to 15 Areas with nest trees and Cosumnes Preserve	March 1 to August 15	August to February near active nest sites
Burrowing owl	MP 0.0 – 0.8 Any potential nest burrows	March to August	September to February near active nest sites

## 5.3 Habitat Compensation

Habitat compensation may be required for the following species:

- Vernal pool fairy shrimp and tadpole shrimp
- Giant Garter Snake



Based on an evaluation of the opportunities and constraints of mitigation, SMUD proposes to implement one or more of the following measures to compensate for permanent loss of wetlands and habitat for special-status species from construction of the CPP facility. Final habitat compensation requirements will be determined through formal consultations with USFWS, NMFS, and CDFG with oversight from CEC.

- Acquire and preserve, in perpetuity, \_\_\_-acres of vernal pool habitat for special-status species if determined necessary through formal consultation with USFWS, NMFS, and CDFG.
- Provide an endowment fund for the third-party costs of management and monitoring of the preserved habitats in perpetuity
- Provide the title to preserved lands to the Sacramento Trust for Open Lands, or similar third-party organization to hold and manage the trust and endowment fund in perpetuity
- Provide funding and technical assistance to the Nature Conservancy to implement habitat enhancement for giant garter snake within the Cosumnes River Preserve.

## 5.4 Mitigation for Impacts to Waters of the U.S.

Construction in the bed or banks of any stream or riparian habitat would potentially cause increases in erosion, contamination, hydrologic changes, or vegetation removal that would reduce the ecological and functional values of the stream or wash. In addition to the general mitigation measures to protect biological resources, the following specific measures would be taken to minimize impacts to “waters of the U.S.” and/or state waters.

For any location where project construction would fill jurisdictional waters, or occur in the “bed and banks” of streams, the applicant would obtain and comply with the applicable conditions of permits issued from the USACE (Section 404, Clean Water Act) and the CDFG (Streambed Alteration Agreement, Section 1601 as applicable). The terms and conditions of these permits may require payment of in-lieu fees to be used towards the purchase or restoration of “waters of the U.S.,” including wetlands, in the regional vicinity of the CPP project. The final mitigation requirements for impacts to jurisdictional waters would be determined through continuing consultation with USACE, USFWS, and CDFG. Implementation of the conditions associated with these permits would be sufficient to protect the biological resources or mitigate for loss of biological resources at these locations. The application provided to the USACE would provide sufficient analysis of alternatives to identify the least environmentally damaging practicable alternative, as specified under Section 404(b)(1) guidelines.

## 5.5 Mitigation for Vernal Pool Plants and Invertebrates

The grassy plateau east of Rancho Seco supports many vernal pools in a nearly natural state. Between the project site and Rancho Seco, there is a complex of degraded swales that have some vernal pool characteristics that are crossed by existing power lines and underground pipelines, and may support vernal pool fauna. New transmission lines and water supply lines for the CPP project would also cross through this area. This particular complex of vernal pools is at a lower elevation than those east of the reservoir, and appear to support sparse vegetation and turbid water indicating a degraded condition.

The swale north of CPP site contains vernal pool tadpole shrimp that would be directly affected. Because the species is readily transferred among pools in close proximity, any vernal pools and 250-foot buffer areas around the pools in the project vicinity are considered by the USFWS as potential habitat.

The gas pipeline alignment crosses many railroad-berm ponding areas in the vicinity of Franklin Boulevard, Twin Cities Road, and elsewhere that have hydrology similar to vernal pools, and vernal pool plants and invertebrates may be present. The gas pipeline was realigned to avoid a large vernal pool in the Cosumnes Preserve at Arno Road.

For guidance on appropriate and consistent mitigation, the USFWS has a programmatic opinion (1-1-96-F-1) for projects in conjunction with 404 permits. The general guidance of that document addresses directly and indirectly affected fairy shrimp habitat. This project is not expected to be appended to the programmatic opinion, but the guidance is useful.

USFWS guidance (USFWS 1996) directs the mitigation ratios shown in Table 8:

**TABLE 8.**  
USFWS Mitigation Ratios

	<b>Bank</b>	<b>Non-bank</b>
Preservation (for direct or indirect impacts)	2:1	3:1
Creation (for direct impacts only)	1:1	2:1

The guidance indicates mitigation ratios for non-bank mitigation may be adjusted to approach those for banks if the [USFWS] considers the conservation value of the non-bank mitigation area to approach that of [USFWS]-approved mitigation banks. Since the area that SMUD would use for mitigation was previously approved for mitigation, SMUD believes that the [USFWS]-approved category is appropriate.

The USFWS guidance of 1996 did not address temporary impacts, potentially because at the time there were no data on recovery of temporarily disturbed vernal pools. In 1997, SMUD submitted monitoring data on the Cogeneration Natural Gas Pipeline and Procter and Gamble Cogeneration Projects that showed 91% recovery of fairy shrimp after pipeline construction. Based in part on those data, and a confirmation of the actual disturbance during construction, the USFWS issued an amendment to the Formal Section 7 consultation reducing the mitigation from an approximately 200-acre mitigation bank on Rancho Seco, to a 9.65 acres site. The mitigation site and a buffer around the site were set aside by recording a conservation easement on the mitigation site and buffer. The mitigation site supports a population of Sacramento Orcutt grass, as well as listed crustaceans. Based on the evidence that 90% of pools recover from temporary disturbance from pipeline construction, we believe a preservation ratio of 0.2:1 is appropriate. This ratio would mitigate for the 10% loss at a ratio of 2:1 or 20%. The referenced pipeline was 25 miles long with approximately 26 miles of lateral lines, and was compensated with 9.65 acres of preserved habitat.

With respect to vernal pool mitigation, there is a particular opportunity in this project to benefit and enhance regional resources for fairy shrimp and other vernal pool organisms. As described previously, there are 3 degraded seasonal wetlands (DSW 1, 2, and 3) located approximately 0.2 mile north of the project site near Rancho Seco Plant. These pools would not be directly affected by any project construction. These pools were evidently excavated during construction of Rancho Seco, and were used to recapture concrete washwater. When active the pools were lined with plastic, and the washwater may have contained TSP, EDTA, or mild acid. Tadpole shrimp have been observed in DSW 2, but vegetation is depauperate and there are scraps of plastic and trash that degrade the quality of this habitat. SMUD proposes that restoration of these pools, totaling 1.80 acres should be a component of wetland mitigation for this project.

Based on wetland surveys, aerial photograph review, a concerted effort to avoid through siting and alternative construction, SMUD has quantified the area of potential impact (see Table 9) and recommends the following mitigation measures:

**TABLE 9.**  
Area of Potential Impact

Location	Affected Area (acre)	Temporary , Permanent, Direct or Indirect	Compensation Ratio ## Preservation (P) ## Creation (C)	Total Compensation Area (Acres)
Project Site, transmission line, water line, access road and laydown area.	0.199	Direct, Permanent	2:1 P 1:1 C	0.4 P 0.2 C
Project Site, transmission line, water line, access road and laydown area.	1.95	Temporary, Indirect	0.2:1 P	0.4 P
Pipeline Direct	2.49	Direct, Temporary	0.2:1 P	0.5 P
Pipeline Indirect	6.96	Indirect, Temporary	0.2:1 P	1.4 P
Restoration Component				1.8 R
<b>Total</b>	.			<b>2.7 P</b> <b>0.2 C</b> <b>1.8 R</b>

1. Design the project and pipeline corridor to avoid to the extent practical all vernal pools, man-made ditches and railroad ditches that could potentially support vernal pool invertebrates.
2. In the vicinity of vernal pools, minimize construction corridor width to avoid to the extent practical disturbing vernal pools.
3. Conduct preconstruction habitat assessments within the project construction zones to identify and quantify areas where vernal pool species could occur.
4. Identify and report observations of vernal pool invertebrates during the course of surveys for other species.
5. Implement stormwater pollution prevention plan to reduce the potential for contaminants to enter waters or depressions where vernal pool invertebrates may occur.
6. After construction, restore the surface topography to pre-construction shape. This method has been shown to be effective in restoring at least 90% of vernal pool invertebrate habitat.
7. Provide off-site compensation for direct permanent impacts in the ratio of 1 disturbed acre to 2 preserved acres (1:2), plus 1 disturbed acre to 1 constructed acre (1:1) for each acre of permanent disturbance of habitat on the project.
8. Provide off-site compensation in the ratio of 1 disturbed acre to 2 preserved acre (2:1) for every acre of indirectly disturbed habitat, comprising potential habitat within 250 feet of construction that would potentially be affected by hydrology (See Appendix B).
9. Provide off-site compensation in the ratio of 1 disturbed acre to 0.2 preserved acre (0.2:1) for every acre of temporarily disturbed habitat (see USFWS 1998).

Mitigation would consist of providing off-site habitat and management of existing or created vernal pools to support the resources that would be affected by the project. If the vernal pool is found to be under the jurisdiction of the USACE through a wetland delineation, mitigation for loss of wetlands would be incorporated into the vernal pool species mitigation. The final mitigation requirements for the vernal pool species would be negotiated between the USACE, USFWS, and SMUD.

## 5.6 Protection of Fish and Aquatic Species in Waterways

The Cosumnes River and tributaries support chinook salmon, steelhead, and Sacramento splittail. Protection measures were developed for CPP to prevent sediments and construction debris from entering waterways through a site specific erosion control and restoration plan. Silt fencing and/or other sediment controls will be used at each construction location, including the stormwater and wastewater outfalls. Stormwater and construction water from the CPP site during operation will be discharged under NPDES permit. The discharge will be monitored according to the requirements of the permit.

The use of HDD for constructing the gas pipeline under the Cosumnes River, Badger and Laguna creeks, and Cosumnes Preserve will minimize impacts to the aquatic and riparian habitat. Potential impacts could occur if inadvertent returns of drilling mud (frac-out) enter the waterway through a fissure or crack in the soils. The drilling mud (normally bentonite) is a non-toxic clay material often used as an impervious layer in wetland construction and by farmers as a soil enhancement. When drilling muds enter a waterway, it can smother benthic invertebrates, aquatic plants, fish eggs, and young fish. A contingency plan will be developed for the CPP HDD activities and is presented in Appendix C. The plan outlines how an inadvertent return of drilling mud will be minimized, contained, and cleaned up. It also presents emergency contact numbers and a spill response team to contact in case of excessive spills.

A Biological Monitor will be on-site or on-call during the HDD and will assist SMUD in monitoring for frac-outs during the drilling operation. The Biological Monitor will consult with CDFG and assist in coordinating the containment and clean up of spilled drilling mud.

- HDD equipment and materials will be located at least 150 feet from Cosumnes River and Badger and Laguna creeks riparian corridors.
- Construction under the waterways should occur during the dry season (July through September) when salmon and steelhead are not expected to be in the river and creeks. In addition, this timing is during the giant garter snake active period and work window.

## 5.7 California Tiger Salamander

Surveys for California tiger salamander on the project site and along the gas pipeline construction corridor detected no tiger salamanders, and an abundance of bullfrogs, crayfish, bass and other salamander predators. Although there are known records of salamanders in ponds east of Rancho Seco (approximately 1 mile east of the project site), it appears that their presence on the site and along the pipeline is unlikely. Measures already noted above to avoid and minimize impacts to aquatic habitats will have additional benefits for any tiger salamanders that may be in the project area.

## 5.8 Protection for Western Pond Turtle

Appropriate breeding habitat for western pond turtle is present along the waterways of Clay Creek, Laguna Creek, Badger Creek and the Cosumnes River. Underground burrows on the gas pipeline alignment could provide upland aestivation and shelter habitat and

possible nesting habitat for turtles. The USFWS, CDFG, and the CEC were consulted for appropriate measures that would minimize impacts to listed species. Protection measures were developed for CPP to prevent sediments and construction debris from entering waterways as described in the erosion control and restoration plan. The mitigation and protection measures proposed for the project to avoid impacts to special-status salamanders and turtles include:

1. Conduct preconstruction habitat assessments within the project construction zones to locate areas where turtles could occur.
2. Find and relocate individual animals prior to ground disturbance activities
3. Set up construction zone limits at the creek banks, using silt fencing to restrict access by salamanders and turtles into construction areas and place signage indicating the area is protected and not accessible for construction equipment and materials
4. Relocate any turtle, or other wildlife to safe areas outside the construction zone limits
5. Provide a qualified Biological Monitor during construction within potential tiger salamander and western pond turtle habitats
6. Monitor stormwater discharge from the site for water quality parameters identified in the NPDES permit that protect beneficial uses

## 5.9 Protection Measures for Giant Garter Snake

Appropriate habitat for giant garter snake (GGS) comprises dense cattail or bulrush cover, with downed woody debris and partial shading to provide thermal cover. Wetland habitats on the project site do not have permanent water and dense cover that would support fish or highly aquatic species such as the giant garter snake; however, it is recorded from Badger Creek, near the Cosumnes River confluence and could occur in connected waterways that support appropriate habitat. The gas pipeline crosses or passes close to wetland and marsh habitats ranging from completely aquatic sites (Cosumnes River, Badger Creek, Laguna Creek), cattail and bulrush marsh (Cosumnes River), farm ponds (Arno Road, Valensin Road), roadside ditches and swales (near town of Franklin, south of CCF), and vernal pools. Most of these lack the hydrology or vegetation to support GGS.

Giant garter snakes are actively foraging in warm months from May through September and typically hibernate in underground burrows (hibernacula) from October through April and are highly susceptible to earth moving equipment during this time. Impacts to giant garter snakes can occur from the excavation of streams and/or irrigation canals and hibernacula during hibernation periods.

Under the Programmatic Consultation Agreement (USFWS 1997), the project would fit the definition of a "Level 1" project.

Level 1 project impacts result in minimal environmental effects, such as repair, rehabilitation, or replacement of previously authorized structures, survey activities, temporary recreational structures, utility lines installation by boring underneath irrigation canals or creek channels, and temporary cofferdams. Level 1 projects include those routinely authorized under Nationwide Permit number 12 (Installation of Utility Lines), and 33 (temporary construction, access and dewatering). The work would not result in any permanent loss of habitat and the temporary disturbance area would not exceed 20.00 acres of habitat.

CPP would implement the following mitigation for a Level 1 project, as described in the programmatic consultation:

- Restore temporary impacts areas to giant garter snake habitat
- Monitor for one year post-construction with photo documentation report due one year from the restoration implementation showing pre- and post-project area photos

## 5.10 Mitigation and Protection Measures for Swainson's hawk

Swainson's hawks nest in large riparian cottonwoods, oaks, and other large trees and forage over short-grass prairies and farm fields up to 10 miles from the nest. Swainson's hawks are sensitive to disturbance during nesting and CDFG recommends a 0.5-mile buffer between construction and active nests. Several areas along the gas pipeline route have the potential for nests, particularly in the Cosumnes Nature Preserve. A Swainson's hawk could nest in any of these in any year. If present, construction at the project site could potentially cause nest abandonment.

Mitigation and protection measures for Swainson's hawk include:

- Implement nest surveys within 0.5 mile of project features in early spring 2003 to determine use by Swainson's hawk if construction during the nesting season is anticipated.
- If project features are within 0.5 mile of Swainson's hawk nesting, avoid construction within 0.5 mile during nesting season, if feasible. If construction does occur within 0.25 mile of an active nest site consultation with CDFG may require a full-time Biological Monitor while birds are on the nest. Temporary disturbance from construction may be allowed with monitoring by the Biological Monitor.

## 5.11 Protection Measures for Western Burrowing Owl

The burrowing owl is known to nest in the Central Valley. Railroad berms, canal banks and agricultural areas near the project site may contain suitable habitat for burrowing owls, although only one pair was detected in 2002 surveys (Sims Road).

The following measures would minimize the potential impacts to burrowing owls:

- Preconstruction surveys of pipeline and linear facilities would be conducted in the spring to determine whether the ground squirrel burrows are occupied by burrowing owls if construction is planned for the nesting season.
- Protect active nest burrows with a 250-foot buffer during the breeding season (February 1 through August 31) or until young have left the nest.
- Conduct passive relocation prior to construction if winter burrows are found before February 1 and/or restrict construction activities within 150 feet during non-breeding season.
- Provide habitat compensation for any active nest burrow that could not be avoided during construction through consultation with CDFG.

## 5.12 Protection for Nesting and Migratory Birds

Raptors, herons, egrets, waterfowl, and belted kingfisher are resident and migratory species occurring in the CPP project area, and are protected under the Migratory Bird Treaty Act

and California Fish and Game Code. Disturbance of nest sites, which is prohibited under Section 3503.5 of the Fish and Game Code, could result in abandonment of eggs or young.

Preconstruction surveys will be conducted for nesting raptors within 500 feet of construction activities. Surveys will also be conducted within 100 feet on either side of the entire gas pipeline alignment. Resident birds often begin nesting as early as February in California. Nest searches will be conducted in December/January (if not earlier) before site construction begins and the vegetation within laydown and construction areas will be removed and/or mowed by February 1<sup>st</sup> to minimize the potential for birds to nest within the construction areas. If nests are found with no eggs or young, the nest will be removed. If nesting birds with eggs or young are found during the surveys, the Biological Monitor will coordinate with the Designated Biologist and CDFG for possible relocation or rehabilitation at an approved wildlife rehabilitation center.

Field surveys to identify active raptor nest sites will be conducted in the spring prior to construction. If nest sites are found within 500 feet of construction areas, the Designated Biologist will implement mitigation measures appropriate to the circumstances. In most cases, a construction zone limit will be placed around the nest site at a distance of not less than 500 feet. If an exclusion zone cannot reasonably be implemented at this distance, the following measures may be implemented:

1. SMUD may postpone construction in that area until young are fledged, or
2. Provide a Biological Monitor to monitor the birds on the nest and stop construction if it appears that the birds will abandon the nest or young, or
3. Consult with the CDFG if construction appears to jeopardize the nesting success and provide for the artificial rearing of eggs or young by qualified staff.

### **5.13 Mitigation for Impacts to Birds from Collisions with Electric Transmission Lines**

The Central Valley within the Pacific Flyway is used by migratory birds in the area, and a new transmission line in this corridor may result in a minor increase of bird collisions. Special consideration was given to the potential impacts on raptor and migratory bird species. The transmission line route was designed to minimize the length and crossing of open areas (often used as forage during migration) thereby limiting the collision opportunities for resident and migratory birds. To prevent electrocutions, the transmission line will be designed to space conductor wires further apart than the wing span of a large birds (43 inches on the vertical and 60 inches on the diagonal) (APLIC 1996) and is commonly used as mitigation for reducing potential avian electrocutions and collisions. No further mitigation is proposed for impacts from the electric transmission line.

## 6.0 Conclusion and Determination

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Effect determinations for each of the special-status species that could potentially occur in the project action area were discussed in the previous sections. The following paragraphs summarize those effect determinations for the listed and special concern species that are known or are assumed to occur in the project area that could be affected by CPP construction and operation after mitigation and protection measures are implemented.

### **Threatened (T), Endangered (E), Proposed Threatened (PT) or Proposed Endangered (PE) Species**

The CPP project overall *may affect, but is not likely to adversely affect*, the federal listed species that are known or assumed to occur in the action area. These listed species include vernal pool tadpole shrimp, vernal pool fairy shrimp, Valley elderberry longhorn beetle, winter and spring-run Chinook salmon, Central Valley steelhead, Sacramento splittail, giant garter snake. With protection and mitigation measures developed through consultation with the USFWS and CDFG, the CPP project avoided and minimized construction and operation impacts to the furthest extent feasible.

The ratio for compensatory habitat purchase and preservation was determined through informal consultation with USFWS and CDFG. The location for the proposed mitigation will support habitat for the special-status species identified in this consultation and will be approved by USFWS and/or CDFG prior to construction.

### **State Listed Species**

The CPP project *may affect, but is not likely to adversely affect*, Swainson's hawk and greater sandhill crane. With protection and mitigation measures developed through consultation with CDFG, the CPP will provide appropriate off-site habitat compensation for the loss of forage habitat. The location for this proposed mitigation will be approved by CDFG prior to the start of construction.

### **Candidate Species, Sensitive Species and Species of Concern**

The CPP project *may affect, but is not likely to adversely affect*, the species of concern and species of special concern. These species include fall and late fall-run chinook salmon, California tiger salamander, burrowing owl, American bittern, and other nesting or migratory birds in the Pacific Flyway.

Protection and mitigation measures developed for the listed species will provide protection for species of concern that are not protected under the ESA.



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**TABLE 1.**

Special Status Species Potentially Occurring in the Proposed Cosumnes Power Plant Project Area, Their Status, and Determination of Potential Project Affect.

Species Name	Status*	Habitat†	Not likely to Affect	May Affect	Comments
<b>PLANTS AND HABITATS</b>					
Slender orcutt grass <i>Orcuttia tenuis</i>	FT	VP	X		Species is known from pools east of Rancho Seco site
Sacramento orcutt grass <i>Orcuttia viscida</i>	FE	VP	X		Species known from vernal pools near Rancho Seco
Fleshy (=succulent) owl's clover <i>Castilleja campestris</i> ssp. <i>succulenta</i>	FT	VP	X		Not known from Sacramento County
Boggs Lake hedge-hyssop <i>Gratiola heterosepala</i>	CE, 1B	VP	X		Not known from project site.
Valley sagittaria (Sanford's arrowhead) <i>Sagittaria sanfordii</i>	SC	AW, VP	X		Not known from project site.
Legenere <i>Legenere limosa</i>	SC, 1B	VP		X	Species is known from Badger Creek and Laguna Creek
Delta tule pea <i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	SC	CM		X	Species is known from Badger Creek and Cosumnes River
Mason's lilaeopsis <i>Lilaeopsis masonii</i>	SC	CM, CR		X	Species may occur in Cosumnes and Badger confluence area.
<b>INVERTEBRATES</b>					
Antioch Dunes anthicid beetle <i>Anthicus antiohensis</i>	SC	Sandy soils	X		No suitable habitat
Sacramento anthicid beetle <i>Anthicus sacramento</i>	SC	Sandy soils	X		No suitable habitat
Vernal pool tadpole shrimp <i>Lepidurus packardi</i>	FE	SW		X	In vernal pool north of CPP site and in seasonal ponding areas along gas pipeline
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT	SW		X	In vernal pool north of CPP site and in seasonal ponding areas along gas pipeline
California linderiella <i>Linderiella occidentalis</i>	SC	VP		X	In vernal pool north of CPP site and in seasonal ponding areas along gas pipeline
Midvalley fairy shrimp	SC	VP		X	Could occur along with other vernal pool species, no

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Species Name	Status*	Habitat†	Not likely to Affect	May Affect	Comments
<i>Branchinecta mesovallensis</i>					surveys conducted.
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	FE	SW	X		Distribution is outside project area
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT	elderberry shrubs		X	Scattered shrubs along gas pipeline alignment near El;k Grove Blvd.
<b>FISH</b>					
Winter-run chinook salmon <i>Oncorhynchus tshawytscha</i>	FE, SE	migration, CR	X		May occur seasonally in Cosumnes River. Construction will avoid water.
Spring-run chinook salmon <i>Oncorhynchus tshawytscha</i>	FT	migration, CR	X		May occur seasonally in Cosumnes River. Construction will avoid water.
Fall/late fall -run chinook salmon <i>Oncorhynchus tshawytscha</i>	C	migration, CR	X		May occur seasonally in Cosumnes River. Construction will avoid water.
Delta smelt <i>Hypomesus transpacificus</i>	FT, ST	Downstream of Cosumnes River in Sacramento-San Joaquin river delta	X		May occur seasonally in Cosumnes River. Construction will avoid water.
Central Valley steelhead <i>Oncorhynchus mykiss</i>	FT	migration, CR	X		May occur seasonally in Cosumnes River. Construction will avoid water.
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	FT	CR	X		May occur seasonally in Cosumnes River. Construction will avoid water.
Green sturgeon <i>Acipenser medirostris</i>	SC	CR	X		Species is not known from project area.
River lamprey <i>Lampetra ayresi</i>	SC	CR	X		Construction will avoid Cosumnes River.
Pacific lamprey <i>Lampetra tridentata</i>	SC	CR	X		Construction will avoid Cosumnes River.
Kern brook lamprey <i>Lampetra hubbsi</i>	SC	CR?	X		Construction will avoid Cosumnes River.

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Special Status Species Potentially Occurring in the Proposed Cosumnes Power Plant Project Area, Their Status, and Determination of Potential Project Affect.

Species Name	Status*	Habitat†	Not likely to Affect	May Affect	Comments
Longfin smelt <i>Spirinchus thaleichthys</i>	SC	CR	X		
<b>REPTILES AND AMPHIBIANS</b>					
California tiger salamander <i>Ambystoma californiense</i>	C	AG, VP		X	Known records within 1.25 miles of CPP site, but not detected in surveys of gas line or project site
Western spadefoot toad <i>Scaphiopus hammondi</i>	SC/CSC	VP		X	
California red-legged frog <i>Rana aurora draytonii</i>	FT	W, pond	X		Not known from this project area.
Foothill yellow-legged frog <i>Rana boylei</i>	SC	none	X		Not known from this project area.
Giant garter snake <i>Thamnophis gigas</i>	FT, ST	AW, sloughs and creeks, CRP		X	Known to occur in sloughs and ditches near Badger Creek and Cosumnes River along gas pipeline.
California horned lizard <i>Phrynosoma coronatum frontale</i>	SC	Sandy soil	X		Not known from this project area.
Western pond turtle <i>Clemmys marmorata</i>	SC	W, AW, CRP		X	Occurs in Clay Creek, Rancho Seco Reservoir, Cosumnes and tributaries.
<b>BIRDS</b>					
American bittern <i>Botaurus lentiginosus</i>	SC	Nesting, CRP, AW	X		Proposed action will avoid nest habitat in Cosumnes Preserve and potential for nesting near waterways
White-faced ibis <i>Plegadis chihi</i>	SC	Winter forage CRP, AW, flooded crop, pastures	X		May occur in Cosumnes seasonally.
White-tailed kite <i>Elanus leucurus</i>	SC, FP	Nesting, CRP, RI, AC, AG	X		Proposed action will avoid nests.
Bald eagle <i>Haliaeetus leucocephalus</i>	FT, SE	winter forage, CRP, AC, AG	X		May occur as winter migrant in region. Nearest historical record of nest 5 miles from project.
Swainson's hawk <i>Buteo swainsoni</i>	ST	Nesting,		X	At least 5 historical and current nests known to occur along pipeline and in Cosumnes Preserve

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Species Name	Status*	Habitat†	Not likely to Affect	May Affect	Comments
Ferruginous hawk <i>Buteo regalis</i>	SC	CRP, RI, AC, AG winter forage, AG	X		May occur in region during winter migration.
Greater sandhill crane <i>Crus canadensis tabida</i>	ST, FP	winter forage, CRP, AC, AG		X	Cosumnes Preserve is major wintering area.
Mountain plover <i>Charadrius montanus</i>	PT	winter forage, CRP ,AG	X		May forage in agricultural habitats as winter migrant.
Burrowing owl <i>Athene cunicularia hypugea</i>	SC/CSC	AG, CRP		X	Potential foraging habitat on project site and potential nesting habitat along gas pipeline. One pair observed during surveys at Sims Road.
Little willow flycatcher <i>Empidonax traillii brewsteri</i>	SC/SE	Willow riparian	X		May occur rarely in Cosumnes River Preserve.
Bank swallow <i>Riparia riparia</i>	ST	Steep banks along Sacramento River	X		No suitable habitat
Grasshopper sparrow <i>Ammodramus savannarum</i>	SC	AG, CRP	X		Suspected to nest occasionally in Cosumnes Preserve
Tricolored blackbird <i>Agelaius tricolor</i>	SC	CRP, AC, AG	X		Known to nest in Cosumnes Preserve
<b>MAMMALS</b>					
Small-footed myotis bat <i>Myotis ciliolabrum</i>	SC	R,CRP	X		Project would avoid all riparian habitat and remove no old buildings.
Long-eared myotis bat <i>Myotis evotis</i>	SC	R,CRP	X		Project would avoid all riparian habitat and remove no old buildings.
Fringed myotis bat <i>Myotis thysanodes</i>	SC	R, CRP	X		Project would avoid all riparian habitat and remove no old buildings.
Long-legged myotis bat <i>Myotis volans</i>	SC	R, CRP	X		Project would avoid all riparian habitat and remove no old buildings.
Yuma myotis bat <i>Myotis yumanensis</i>	SC	CRP, R	X		Project would avoid all riparian habitat and remove no old buildings.



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Special Status Species Potentially Occurring in the Proposed Cosumnes Power Plant Project Area, Their Status, and Determination of Potential Project Affect.

Species Name	Status*	Habitat <sup>†</sup>	Not likely to Affect	May Affect	Comments
Pacific western big-eared bat <i>Corynorhinus townsendii townsendii</i>	SC	R, CRP	X		Project would avoid all riparian habitat and remove no old buildings.
Pale Townsend's big-eared bat <i>Plecotus townsendii pallescens</i>	CSC, SC	R, CRP	X		Project would avoid all riparian habitat and remove no old buildings.
Greater western mastiff-bat <i>Eumops perotis californicus</i>	SC		X		Project would avoid all riparian habitat and remove no old buildings.
San Joaquin pocket mouse <i>Perognathus inornatus</i>	SC	AG	X		Project would avoid all riparian habitat and remove no old buildings.
Riparian (San Joaquin Valley) woodrat <i>Neotoma fuscipes riparia</i>	FE	R	X		Not known to occur in project region.
Riparian brush rabbit <i>Sylvilagus bachmani riparius</i>	FE	R	X		Not known to occur in project region.
Ring-tailed cat <i>Bassariscus astutus</i>	FP	CRP, R	X		Project will avoid all riparian habitat.

\* Federal, state, and CNPS listed species.

FE: Federally Endangered

FT: Federally Threatened

SC: Federal Species of Concern

PE: Federal Proposed Endangered

PT: Federal Proposed Threatened

SE: California Endangered

ST: California Threatened

CSC: California Species of Special Concern

FP: California Fully-Protected species

1B: CNPS rare or endangered in California and elsewhere

2: CNPS rare or endangered in California, more common elsewhere

<sup>†</sup> Abbreviations for habitat areas.

CRP: Cosumnes River Preserve

FM: freshwater marsh

CR: Cosumnes River and tributaries

AG: Annual grassland

AW: Agricultural water conveyance canal

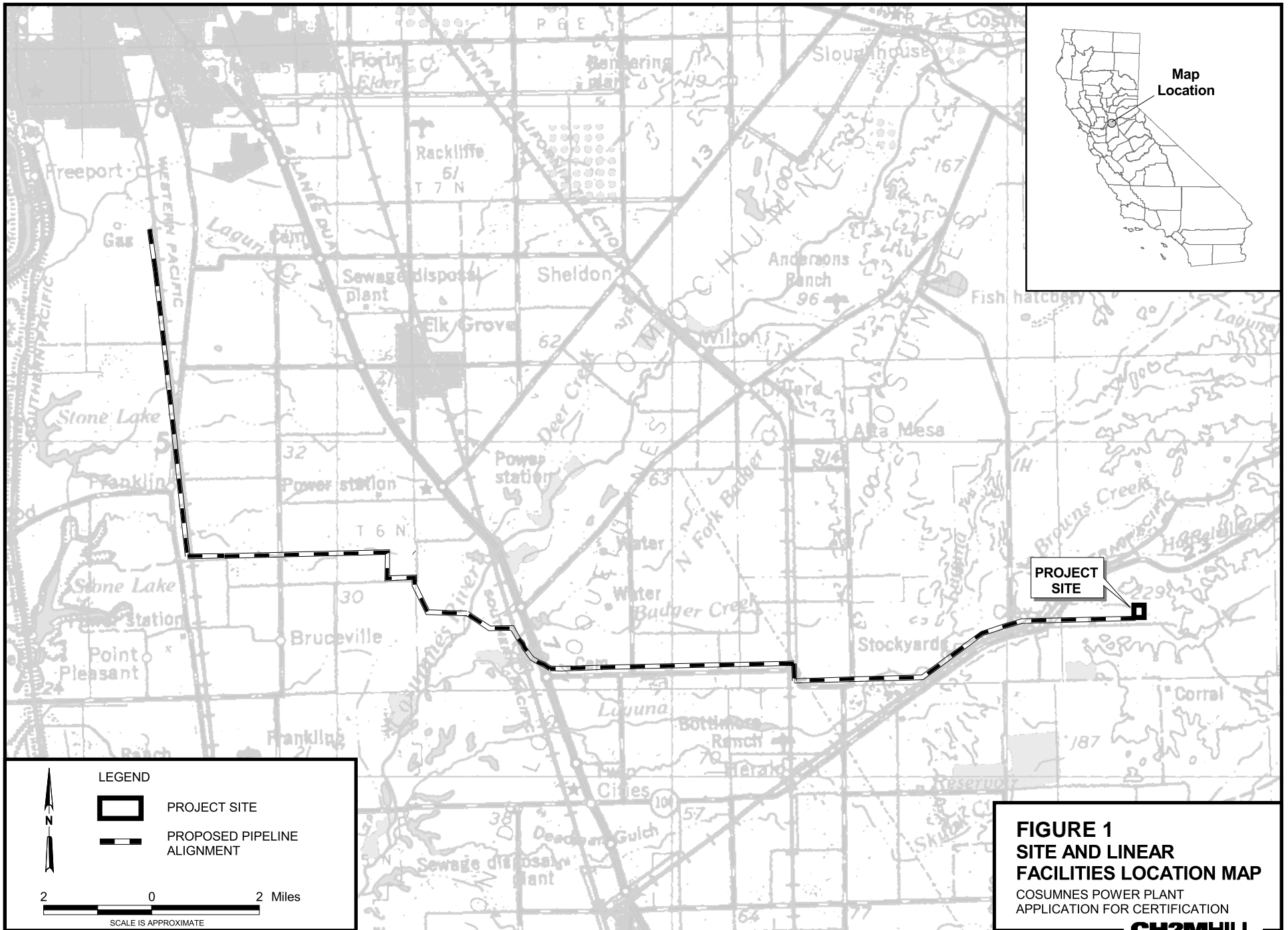
AC: Agricultural crop

R: Riparian

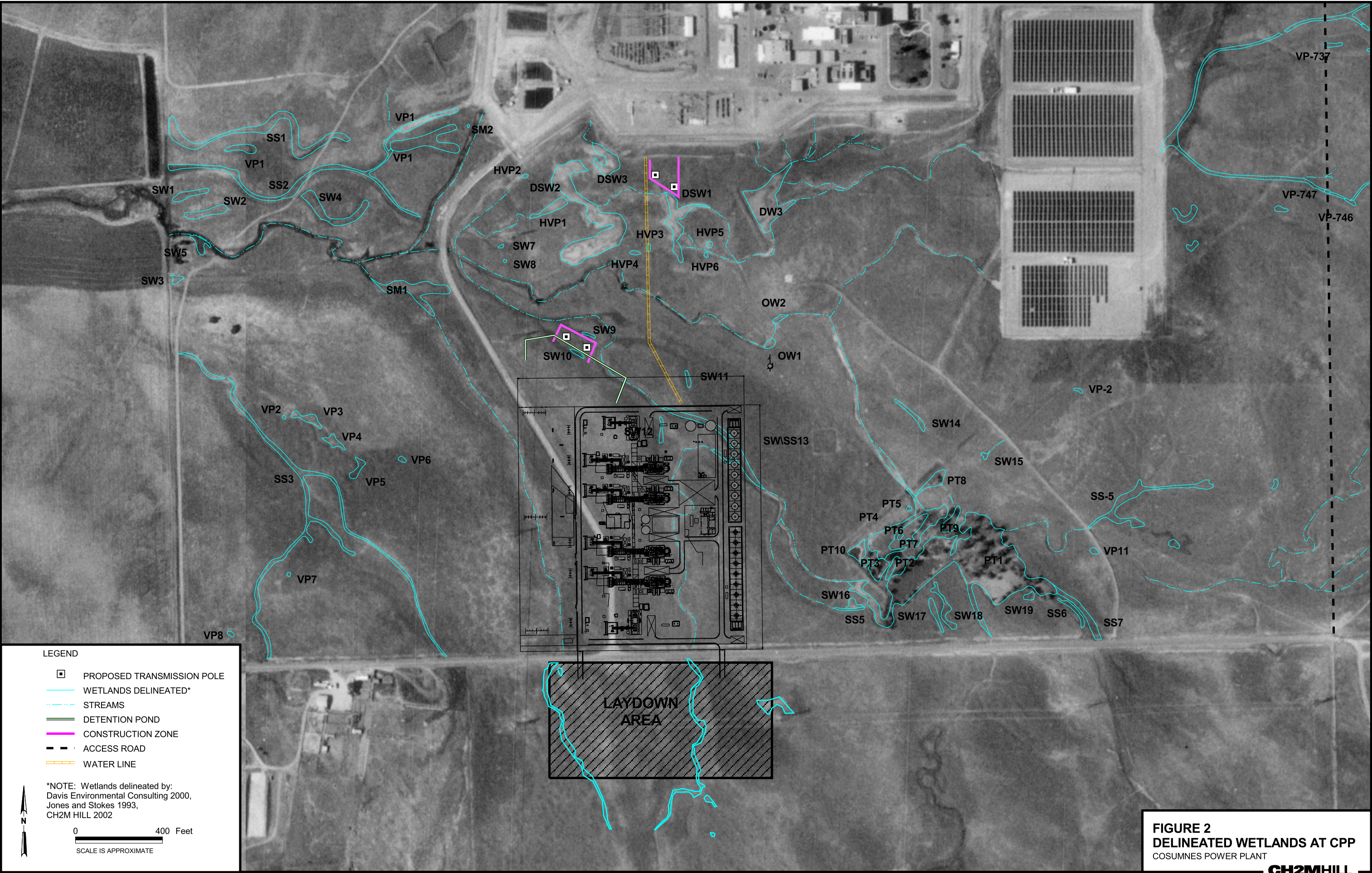
VP: Vernal pool and seasonal wetlands on CPP project site and gas pipeline alignment.

Note: The USFWS and CNDDDB searches included the following 71/2 minute USGS topographic quadrangles: Clay, Goose Creek, Elk Grove, Florin, Bruceville, and Galt.

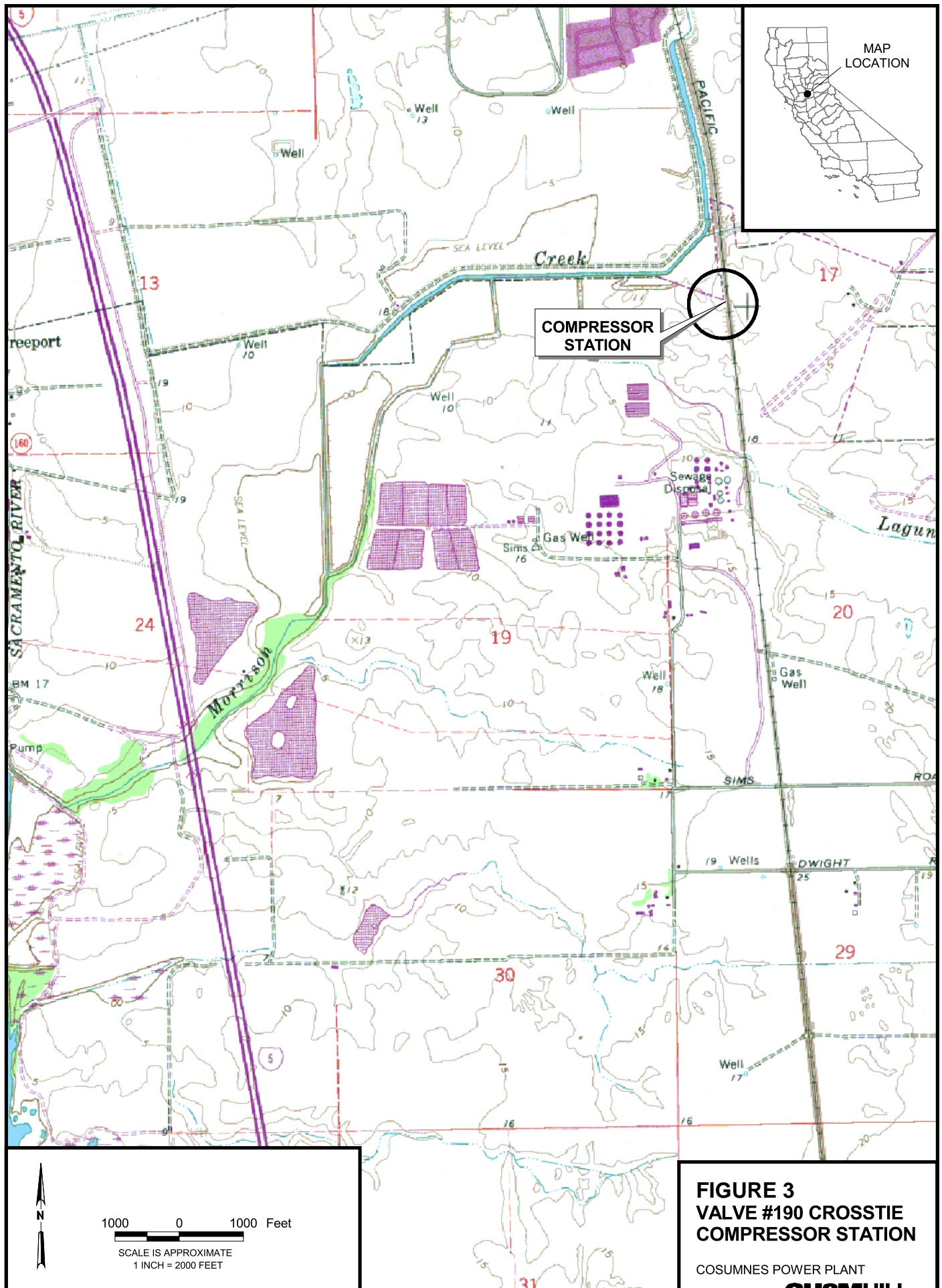
# **INSERT FIGURES 1 - 9**



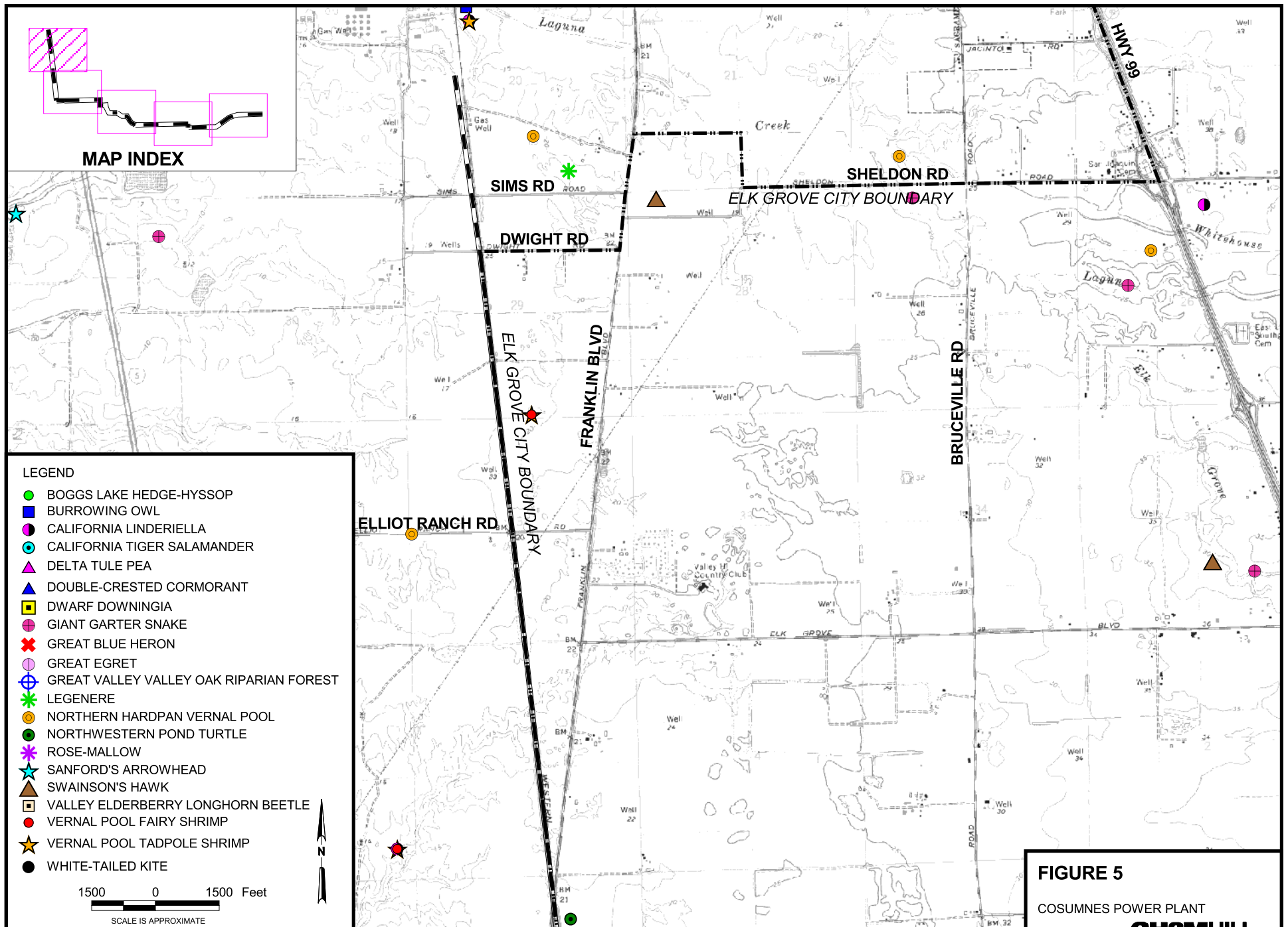


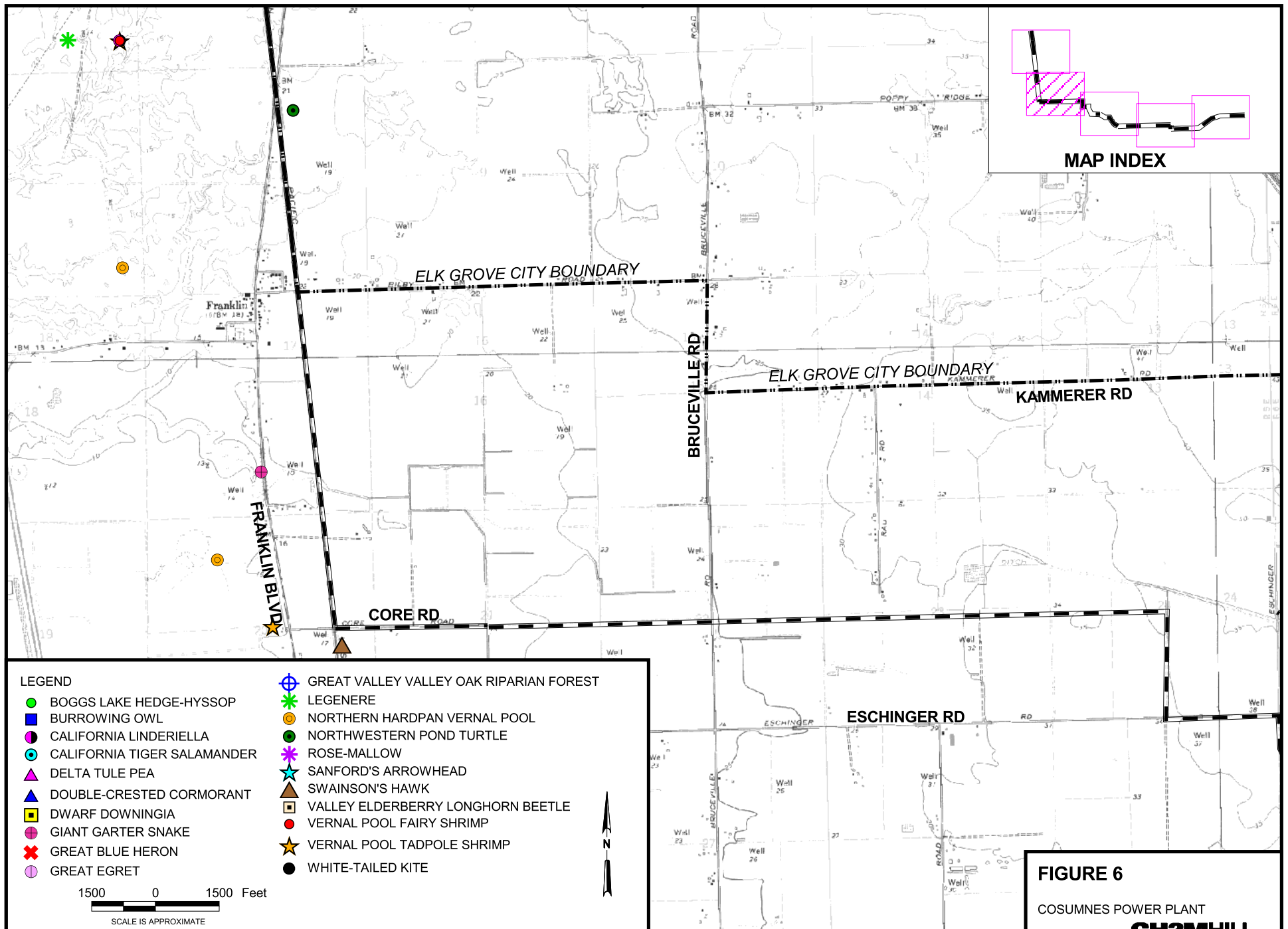




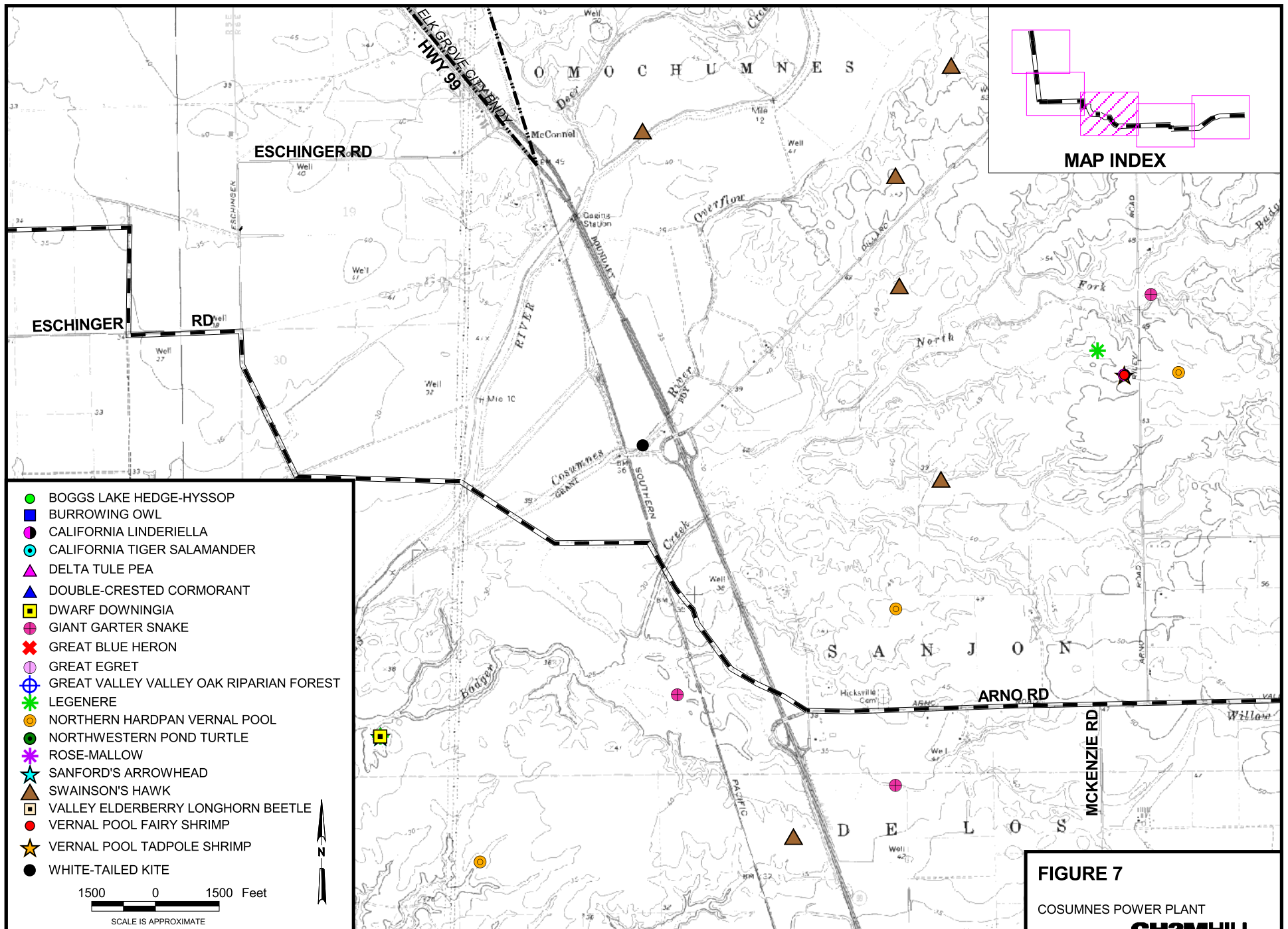


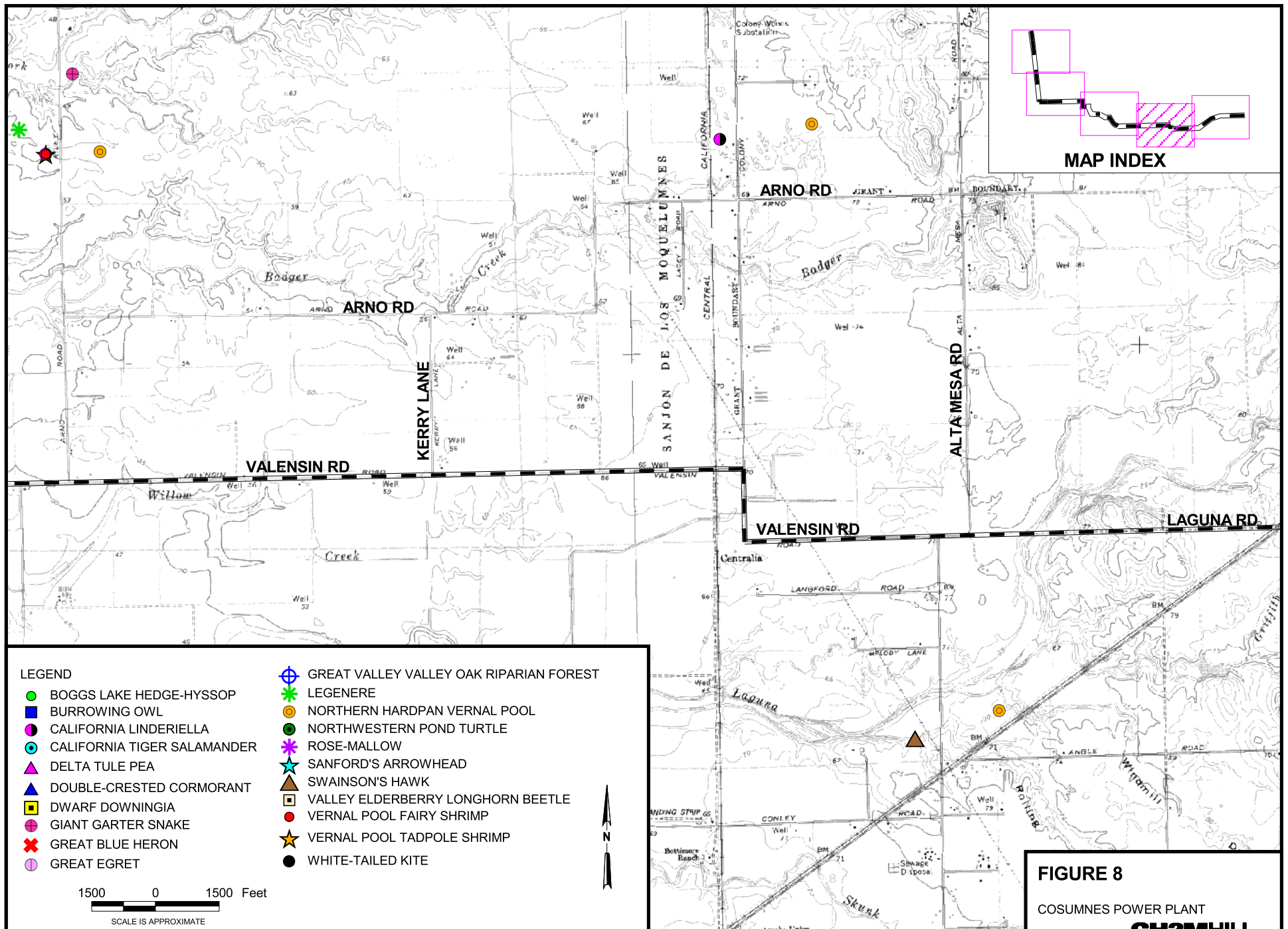




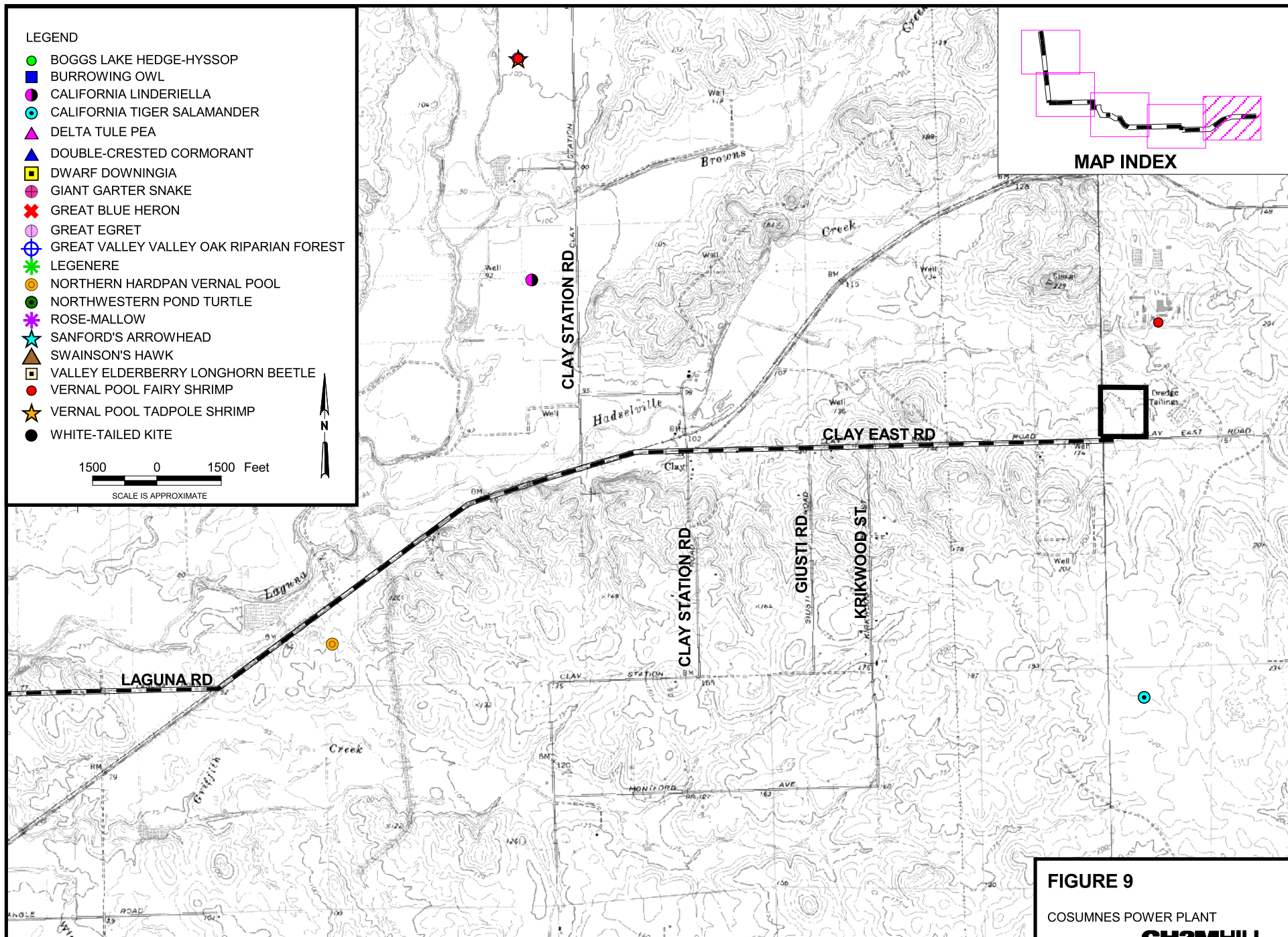












**APPENDIX A**

**Species List Provided by USFWS**



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office  
2800 Cottage Way, Room W2605  
Sacramento, California 95825

IN REPLY REFER TO:  
1-1-02-SP-0949

February 20, 2002

E.J. Koford and Debra Crowe  
CH2M HILL  
2485 Natomas Park Drive  
Sacramento, California 95833

Subject: Species List for Cosumnes Power Plant

Dear E.J. and Debra:

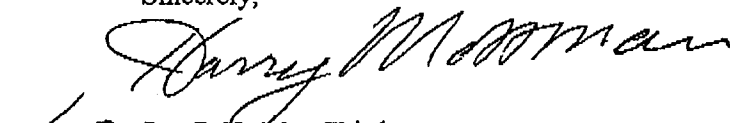
We are sending the enclosed list in response to your , request for information about endangered and threatened species (Enclosure A). The list covers the following U.S. Geological Survey 7 1/2 minute quads:

495C	CLAY
495D	GOOSE CREEK
496A	ELK GROVE
496B	FLORIN
496C	BRUCEVILLE
496D	GALT

Please read Important Information About Your Species List (enclosed). It explains how we made the list and describes your responsibilities under the Endangered Species Act. Contact Ken Fuller at (916) 414-6645, if you have any questions about the attached list or your responsibilities under the Endangered Species Act.

For the fastest response to species list requests, address them to the attention of Harry Mossman at this address. You may fax requests to him at (916) 414-6712 or 414-6713.

Sincerely,

  
for Jan C. Knight, Chief  
Endangered Species Division

Enclosures

Endangered and Threatened Species that May Occur in  
or be Affected by Projects in the Selected Quads Listed Below

Reference File No. 1-1-02-TA-0501

**Cosumnes Power Plant**

February 20, 2002

QUAD: 495C CLAY

**Listed Species**

**Mammals**

- ✓ riparian (San Joaquin Valley) woodrat, *Neotoma fuscipes riparia* (E) \*
- ✓ riparian brush rabbit, *Sylvilagus bachmani riparius* (E) \*

**Birds**

- ✓ bald eagle, *Haliaeetus leucocephalus* (T)

**Reptiles**

- ✓ giant garter snake, *Thamnophis gigas* (T)

**Amphibians**

- ✓ California red-legged frog, *Rana aurora draytonii* (T)

**Fish**

- ✓ delta smelt, *Hypomesus transpacificus* (T)
- ✓ Central Valley steelhead, *Oncorhynchus mykiss* (T) NMFS
- ✓ winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS
- ✓ Central Valley spring-run chinook salmon, *Oncorhynchus tshawytscha* (T) NMFS
- ✓ Critical Habitat, Central Valley spring-run chinook, *Oncorhynchus tshawytscha* (T) NMFS
- ✓ Sacramento splittail, *Pogonichthys macrolepidotus* (T)

**Invertebrates**

- ✓ vernal pool fairy shrimp, *Branchinecta lynchi* (T)
- ✓ valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)
- ✓ vernal pool tadpole shrimp, *Lepidurus packardii* (E)

**Plants**

- fleshy (=succulent) owl's-clover, *Castilleja campestris* ssp. *succulenta* (T)

**Proposed Species**

**Birds**

- ✓ mountain plover, *Charadrius montanus* (PT)

**Candidate Species**

**Amphibians**

- ✓ California tiger salamander, *Ambystoma californiense* (C)

**Fish**

- ✓ Central Valley fall/late fall-run chinook salmon, *Oncorhynchus tshawytscha* (C) NMFS

Critical habitat, Central Valley fall/late fall-run chinook, *Oncorhynchus tshawytscha* (C) NMFS

### Species of Concern

#### Mammals

- ✓ Pacific western big-eared bat, *Corynorhinus* (=Plecotus) *townsendii townsendii* (SC)
- ✓ greater western mastiff-bat, *Eumops perotis californicus* (SC)
- ✓ small-footed myotis bat, *Myotis ciliolabrum* (SC)
- ✓ long-legged myotis bat, *Myotis volans* (SC)
- ✓ Yuma myotis bat, *Myotis yumanensis* (SC)
- ✓ San Joaquin pocket mouse, *Perognathus inornatus* (SC)

#### Birds

- ✓ tricolored blackbird, *Agelaius tricolor* (SC)
- ✓ grasshopper sparrow, *Ammodramus savannarum* (SC)
- short-eared owl, *Asio flammeus* (SC)
- ✓ western burrowing owl, *Athene cunicularia hypugaea* (SC)
- oak titmouse, *Baeolophus inornatus* (SLC)
- ✓ Aleutian Canada goose, *Branta canadensis leucopareia* (D)
- ✓ Swainson's hawk, *Buteo Swainsoni* (CA)
- ✓ ferruginous hawk, *Buteo regalis* (SC)
- Lawrence's goldfinch, *Carduelis lawrencei* (SC)
- Vaux's swift, *Chaetura vauxi* (SC)
- black tern, *Chlidonias niger* (SC)
- ✓ white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)
- ✓ little willow flycatcher, *Empidonax traillii brewsteri* (CA)
- ✓ American peregrine falcon, *Falco peregrinus anatum* (D)
- ✓ greater sandhill crane, *Grus canadensis tabida* (CA)
- loggerhead shrike, *Lanius ludovicianus* (SC)
- Lewis' woodpecker, *Melanerpes lewis* (SC)
- long-billed curlew, *Numenius americanus* (SC)
- Nuttall's woodpecker, *Picoides nuttallii* (SLC)
- ✓ white-faced ibis, *Plegadis chihi* (SC)
- ✓ bank swallow, *Riparia riparia* (CA)
- rufous hummingbird, *Selasphorus rufus* (SC)

#### Reptiles

- ✓ T northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
- ✓ southwestern pond turtle, *Clemmys marmorata pallida* (SC)
- ✓ California horned lizard, *Phrynosoma coronatum frontale* (SC)

**Amphibians**

- ✓ foothill yellow-legged frog, *Rana boylei* (SC)
- ✓ western spadefoot toad, *Spea hammondi* (SC)

**Fish**

- ✓ green sturgeon, *Acipenser medirostris* (SC)
- ✓ longfin smelt, *Spirinchus thaleichthys* (SC)

**Invertebrates**

- ✓ Midvalley fairy shrimp, *Branchinecta mesoamericana* (SC)
- ✓ California linderiella fairy shrimp, *Linderiella occidentalis* (SC)

QUAD: 495D GOOSE CREEK

**Listed Species****Mammals**

- riparian (San Joaquin Valley) woodrat, *Neotoma fuscipes riparia* (E) \*
- riparian brush rabbit, *Sylvilagus bachmani riparius* (E) \*

**Birds**

- bald eagle, *Haliaeetus leucocephalus* (T)

**Reptiles**

- giant garter snake, *Thamnophis gigas* (T)

**Amphibians**

- California red-legged frog, *Rana aurora draytonii* (T)

**Fish**

- delta smelt, *Hypomesus transpacificus* (T)
- Central Valley steelhead, *Oncorhynchus mykiss* (T) NMFS
- winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS
- Central Valley spring-run chinook salmon, *Oncorhynchus tshawytscha* (T) NMFS
- Sacramento splittail, *Pogonichthys macrolepidotus* (T)

**Invertebrates**

- vernal pool fairy shrimp, *Branchinecta lynchi* (T)
- valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)
- vernal pool tadpole shrimp, *Lepidurus packardii* (E)

**Plants**

- fleshy (=succulent) owl's-clover, *Castilleja campestris* ssp. *succulenta* (T)
- ✓ Sacramento Orcutt grass, *Orcuttia viscida* (E)

**Proposed Species****Birds**



- mountain plover, *Charadrius montanus* (PT)

### **Candidate Species**

#### Amphibians

- California tiger salamander, *Ambystoma californiense* (C)

#### Fish

- Central Valley fall/late fall-run chinook salmon, *Oncorhynchus tshawytscha* (C) NMFS

### **Species of Concern**

#### Mammals

- Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)
- greater western mastiff-bat, *Eumops perotis californicus* (SC)
- small-footed myotis bat, *Myotis ciliolabrum* (SC)
- long-eared myotis bat, *Myotis evotis* (SC)
- ✓ fringed myotis bat, *Myotis thysanodes* (SC)
- long-legged myotis bat, *Myotis volans* (SC)
- Yuma myotis bat, *Myotis yumanensis* (SC)
- San Joaquin pocket mouse, *Perognathus inornatus* (SC)

#### Birds

- tricolored blackbird, *Agelaius tricolor* (SC)
- grasshopper sparrow, *Ammodramus savannarum* (SC)
- short-eared owl, *Asio flammeus* (SC)
- western burrowing owl, *Athene cunicularia hypugaea* (SC)
- oak titmouse, *Baeolophus inornatus* (SLC)
- Aleutian Canada goose, *Branta canadensis leucopareia* (D)
- Swainson's hawk, *Buteo Swainsoni* (CA)
- ferruginous hawk, *Buteo regalis* (SC)
- Lawrence's goldfinch, *Carduelis lawrencei* (SC)
- Vaux's swift, *Chaetura vauxi* (SC)
- black tern, *Chlidonias niger* (SC)
- white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)
- little willow flycatcher, *Empidonax traillii brewsteri* (CA)
- American peregrine falcon, *Falco peregrinus anatum* (D)
- greater sandhill crane, *Grus canadensis tabida* (CA)
- loggerhead shrike, *Lanius ludovicianus* (SC)
- Lewis' woodpecker, *Melanerpes lewis* (SC)
- long-billed curlew, *Numenius americanus* (SC)
- Nuttall's woodpecker, *Picoides nuttallii* (SLC)

- white-faced ibis, *Plegadis chihi* (SC)
- bank swallow, *Riparia riparia* (CA)
- rufous hummingbird, *Selasphorus rufus* (SC)
- Brewer's sparrow, *Spizella breweri* (SC)

## Reptiles

- northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
- California horned lizard, *Phrynosoma coronatum frontale* (SC)

## Amphibians

- foothill yellow-legged frog, *Rana boylei* (SC)
- western spadefoot toad, *Spea hammondi* (SC)

## Fish

- green sturgeon, *Acipenser medirostris* (SC)
- ✓ Kern brook lamprey, *Lampetra hubbsi* (SC)
- longfin smelt, *Spirinchus thaleichthys* (SC)

## Invertebrates

- California linderiella fairy shrimp, *Linderiella occidentalis* (SC)

## Plants

- ✓ Boggs Lake hedge-hyssop, *Gratiola heterosepala* (CA)

QUAD: 496A ELK GROVE

**Listed Species**

## Mammals

- riparian (San Joaquin Valley) woodrat, *Neotoma fuscipes riparia* (E) \*
- riparian brush rabbit, *Sylvilagus bachmani riparius* (E) \*

## Birds

- bald eagle, *Haliaeetus leucocephalus* (T)

## Reptiles

- giant garter snake, *Thamnophis gigas* (T)

## Amphibians

- California red-legged frog, *Rana aurora draytonii* (T)

## Fish

- ✓ Critical habitat, delta smelt, *Hypomesus transpacificus* (T)
- delta smelt, *Hypomesus transpacificus* (T)
- Central Valley steelhead, *Oncorhynchus mykiss* (T) NMFS
- winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS
- Central Valley spring-run chinook salmon, *Oncorhynchus tshawytscha* (T) NMFS
- Critical Habitat, Central Valley spring-run chinook, *Oncorhynchus tshawytscha* (T) NMFS

- Sacramento splittail, *Pogonichthys macrolepidotus* (T)

#### Invertebrates

- vernal pool fairy shrimp, *Branchinecta lynchi* (T)
- valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)
- vernal pool tadpole shrimp, *Lepidurus packardii* (E)

#### Plants

- ✓ slender Orcutt grass, *Orcuttia tenuis* (T)

#### Proposed Species

##### Birds

- mountain plover, *Charadrius montanus* (PT)

#### Candidate Species

##### Amphibians

- California tiger salamander, *Ambystoma californiense* (C)

##### Fish

- Central Valley fall/late fall-run chinook salmon, *Oncorhynchus tshawytscha* (C) NMFS
- ✓ Critical habitat, Central Valley fall/late fall-run chinook, *Oncorhynchus tshawytscha* (C) NMFS

#### Species of Concern

##### Mammals

- Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)
- small-footed myotis bat, *Myotis ciliolabrum* (SC)
- long-legged myotis bat, *Myotis volans* (SC)
- Yuma myotis bat, *Myotis yumanensis* (SC)
- San Joaquin pocket mouse, *Perognathus inornatus* (SC)

##### Birds

- tricolored blackbird, *Agelaius tricolor* (SC)
- grasshopper sparrow, *Ammodramus savannarum* (SC)
- short-eared owl, *Asio flammeus* (SC)
- western burrowing owl, *Athene cunicularia hypugaea* (SC)
- oak titmouse, *Baeolophus inornatus* (SLC)
- Aleutian Canada goose, *Branta canadensis leucopareia* (D)
- Swainson's hawk, *Buteo Swainsoni* (CA)
- ferruginous hawk, *Buteo regalis* (SC)
- Lawrence's goldfinch, *Carduelis lawrencei* (SC)
- Vaux's swift, *Chaetura vauxi* (SC)
- black tern, *Chlidonias niger* (SC)

white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)  
 little willow flycatcher, *Empidonax traillii brewsteri* (CA)  
 American peregrine falcon, *Falco peregrinus anatum* (D)  
 greater sandhill crane, *Grus canadensis tabida* (CA)  
 loggerhead shrike, *Lanius ludovicianus* (SC)  
 Lewis' woodpecker, *Melanerpes lewis* (SC)  
 long-billed curlew, *Numenius americanus* (SC)  
 Nuttall's woodpecker, *Picoides nuttallii* (SLC)  
 white-faced ibis, *Plegadis chihi* (SC)  
 bank swallow, *Riparia riparia* (CA)  
 rufous hummingbird, *Selasphorus rufus* (SC)

#### Reptiles

- northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
- southwestern pond turtle, *Clemmys marmorata pallida* (SC)
- California horned lizard, *Phrynosoma coronatum frontale* (SC)

#### Amphibians

- western spadefoot toad, *Spea hammondi* (SC)

#### Fish

- ✓ green sturgeon, *Acipenser medirostris* (SC)
- ✓ river lamprey, *Lampetra ayresi* (SC)
- ✓ Pacific lamprey, *Lampetra tridentata* (SC)
- longfin smelt, *Spirinchus thaleichthys* (SC)

#### Invertebrates

- ✓ Antioch Dunes anthicid beetle, *Anthicus antiochensis* (SC)
- ✓ Sacramento anthicid beetle, *Anthicus sacramento* (SC)
- Midvalley fairy shrimp, *Branchinecta meso Vallensis* (SC)
- California linderiella fairy shrimp, *Linderiella occidentalis* (SC)

#### Plants

- Boggs Lake hedge-hyssop, *Gratiola heterosepala* (CA)
- ✓ legumere, *Legumere limosa* (SC)
- ✓ valley sagittaria (=Sanford's arrowhead), *Sagittaria sanfordii* (SC)

QUAD: 496B FLORIN

#### Listed Species

##### Mammals

- riparian (San Joaquin Valley) woodrat, *Neotoma fuscipes riparia* (E) \*
- riparian brush rabbit, *Sylvilagus bachmani riparius* (E) \*

**Birds**

- bald eagle, *Haliaeetus leucocephalus* (T)

**Reptiles**

- giant garter snake, *Thamnophis gigas* (T)

**Amphibians**

- California red-legged frog, *Rana aurora draytonii* (T)

**Fish**

- Critical habitat, delta smelt, *Hypomesus transpacificus* (T)
- delta smelt, *Hypomesus transpacificus* (T)
- Central Valley steelhead, *Oncorhynchus mykiss* (T) NMFS
- winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS
- Central Valley spring-run chinook salmon, *Oncorhynchus tshawytscha* (T) NMFS
- Critical Habitat, Central Valley spring-run chinook, *Oncorhynchus tshawytscha* (T) NMFS
- Sacramento splittail, *Pogonichthys macrolepidotus* (T)

**Invertebrates**

- vernal pool fairy shrimp, *Branchinecta lynchi* (T)
- valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)
- vernal pool tadpole shrimp, *Lepidurus packardii* (E)

**Proposed Species****Birds**

- mountain plover, *Charadrius montanus* (PT)

**Candidate Species****Amphibians**

- California tiger salamander, *Ambystoma californiense* (C)

**Fish**

- Central Valley fall/late fall-run chinook salmon, *Oncorhynchus tshawytscha* (C) NMFS
- Critical habitat, Central Valley fall/late fall-run chinook, *Oncorhynchus tshawytscha* (C) NMFS

**Species of Concern****Mammals**

- Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)
- small-footed myotis bat, *Myotis ciliolabrum* (SC)
- long-legged myotis bat, *Myotis volans* (SC)
- Yuma myotis bat, *Myotis yumanensis* (SC)
- San Joaquin pocket mouse, *Perognathus inornatus* (SC)

**Birds**

tricolored blackbird, *Agelaius tricolor* (SC)  
grasshopper sparrow, *Ammodramus savannarum* (SC)  
short-eared owl, *Asio flammeus* (SC)  
western burrowing owl, *Athene cunicularia hypugaea* (SC)  
oak titmouse, *Baeolophus inornatus* (SLC)  
Aleutian Canada goose, *Branta canadensis leucopareia* (D)  
Swainson's hawk, *Buteo Swainsoni* (CA)  
ferruginous hawk, *Buteo regalis* (SC)  
Lawrence's goldfinch, *Carduelis lawrencei* (SC)  
Vaux's swift, *Chaetura vauxi* (SC)  
black tern, *Chlidonias niger* (SC)  
white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)  
little willow flycatcher, *Empidonax traillii brewsteri* (CA)  
American peregrine falcon, *Falco peregrinus anatum* (D)  
greater sandhill crane, *Grus canadensis tabida* (CA)  
loggerhead shrike, *Lanius ludovicianus* (SC)  
Lewis' woodpecker, *Melanerpes lewis* (SC)  
long-billed curlew, *Numenius americanus* (SC)  
Nuttall's woodpecker, *Picoides nuttallii* (SLC)  
white-faced ibis, *Plegadis chihi* (SC)  
bank swallow, *Riparia riparia* (CA)  
rufous hummingbird, *Selasphorus rufus* (SC)

#### Reptiles

- northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
- California horned lizard, *Phrynosoma coronatum frontale* (SC)

#### Amphibians

- western spadefoot toad, *Spea hammondi* (SC)

#### Fish

- green sturgeon, *Acipenser medirostris* (SC)
- river lamprey, *Lampetra ayresi* (SC)
- Kern brook lamprey, *Lampetra hubbsi* (SC)
- Pacific lamprey, *Lampetra tridentata* (SC)
- longfin smelt, *Spirinchus thaleichthys* (SC)

#### Invertebrates

- Antioch Dunes anthicid beetle, *Anthicus antiochensis* (SC)
- Sacramento anthicid beetle, *Anthicus sacramento* (SC)

- Midvalley fairy shrimp, *Branchinecta mesoallensis* (SC)
- California linderiella fairy shrimp, *Linderiella occidentalis* (SC)

## Plants

- legumere, *Legumere limosa* (SC)
- valley sagittaria (=Sanford's arrowhead), *Sagittaria sanfordii* (SC)

QUAD: 496C BRUCEVILLE

**Listed Species**

## Mammals

- riparian (San Joaquin Valley) woodrat, *Neotoma fuscipes riparia* (E) \*
- riparian brush rabbit, *Sylvilagus bachmani riparius* (E) \*

## Birds

- bald eagle, *Haliaeetus leucocephalus* (T)

## Reptiles

- giant garter snake, *Thamnophis gigas* (T)

## Amphibians

- California red-legged frog, *Rana aurora draytonii* (T)

## Fish

- Critical habitat, delta smelt, *Hypomesus transpacificus* (T)
- delta smelt, *Hypomesus transpacificus* (T)
- Central Valley steelhead, *Oncorhynchus mykiss* (T) NMFS
- winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS
- Central Valley spring-run chinook salmon, *Oncorhynchus tshawytscha* (T) NMFS
- Critical Habitat, Central Valley spring-run chinook, *Oncorhynchus tshawytscha* (T) NMFS
- Sacramento splittail, *Pogonichthys macrolepidotus* (T)

## Invertebrates

- vernal pool fairy shrimp, *Branchinecta lynchi* (T)
- valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)
- vernal pool tadpole shrimp, *Lepidurus packardii* (E)

**Proposed Species**

## Birds

- mountain plover, *Charadrius montanus* (PT)

**Candidate Species**

## Amphibians

- California tiger salamander, *Ambystoma californiense* (C)

## Fish

- Central Valley fall/late fall-run chinook salmon, *Oncorhynchus tshawytscha* (C) NMFS
- Critical habitat, Central Valley fall/late fall-run chinook, *Oncorhynchus tshawytscha* (C) NMFS

### Species of Concern

#### Mammals

- Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)
- small-footed myotis bat, *Myotis ciliolabrum* (SC)
- long-legged myotis bat, *Myotis volans* (SC)
- Yuma myotis bat, *Myotis yumanensis* (SC)
- San Joaquin pocket mouse, *Perognathus inornatus* (SC)

#### Birds

- tricolored blackbird, *Agelaius tricolor* (SC)
- grasshopper sparrow, *Ammodramus savannarum* (SC)
- short-eared owl, *Asio flammeus* (SC)
- western burrowing owl, *Athene cunicularia hypugaea* (SC)
- oak titmouse, *Baeolophus inornatus* (SLC)
- Aleutian Canada goose, *Branta canadensis leucopareia* (D)
- Swainson's hawk, *Buteo Swainsoni* (CA)
- ferruginous hawk, *Buteo regalis* (SC)
- Lawrence's goldfinch, *Carduelis lawrencei* (SC)
- Vaux's swift, *Chaetura vauxi* (SC)
- black tern, *Chlidonias niger* (SC)
- white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)
- little willow flycatcher, *Empidonax traillii brewsteri* (CA)
- American peregrine falcon, *Falco peregrinus anatum* (D)
- greater sandhill crane, *Grus canadensis tabida* (CA)
- loggerhead shrike, *Lanius ludovicianus* (SC)
- Lewis' woodpecker, *Melanerpes lewis* (SC)
- long-billed curlew, *Numenius americanus* (SC)
- Nuttall's woodpecker, *Picoides nuttallii* (SLC)
- white-faced ibis, *Plegadis chihi* (SC)
- bank swallow, *Riparia riparia* (CA)
- rufous hummingbird, *Selasphorus rufus* (SC)

#### Reptiles

- northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
- California horned lizard, *Phrynosoma coronatum frontale* (SC)

#### Amphibians



- foothill yellow-legged frog, *Rana boylei* (SC)
- western spadefoot toad, *Spea hammondi* (SC)

## Fish

- green sturgeon, *Acipenser medirostris* (SC)
- river lamprey, *Lampetra ayresi* (SC)
- Kern brook lamprey, *Lampetra hubbsi* (SC)
- Pacific lamprey, *Lampetra tridentata* (SC)
- longfin smelt, *Spirinchus thaleichthys* (SC)

## Invertebrates

- Antioch Dunes anthicid beetle, *Anthicus antiochensis* (SC)
- Sacramento anthicid beetle, *Anthicus sacramento* (SC)
- Midvalley fairy shrimp, *Branchinecta mesoamericana* (SC)
- California linderiella fairy shrimp, *Linderiella occidentalis* (SC)

## Plants

- ✓ delta tule-pea, *Lathyrus jepsonii* var. *jepsonii* (SC)
- ✓ Mason's lilaeopsis, *Lilaeopsis masonii* (SC)

QUAD: 496D GALT

**Listed Species**

## Mammals

- riparian (San Joaquin Valley) woodrat, *Neotoma fuscipes riparia* (E) \*
- riparian brush rabbit, *Sylvilagus bachmani riparius* (E) \*

## Birds

- bald eagle, *Haliaeetus leucocephalus* (T)

## Reptiles

- giant garter snake, *Thamnophis gigas* (T)

## Amphibians

- California red-legged frog, *Rana aurora draytonii* (T)

## Fish

- Critical habitat, delta smelt, *Hypomesus transpacificus* (T)
- delta smelt, *Hypomesus transpacificus* (T)
- Central Valley steelhead, *Oncorhynchus mykiss* (T) NMFS
- winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS
- Central Valley spring-run chinook salmon, *Oncorhynchus tshawytscha* (T) NMFS
- Critical Habitat, Central Valley spring-run chinook, *Oncorhynchus tshawytscha* (T) NMFS
- Sacramento splittail, *Pogonichthys macrolepidotus* (T)

## Invertebrates

- vernal pool fairy shrimp, *Branchinecta lynchi* (T)
- valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)
- vernal pool tadpole shrimp, *Lepidurus packardii* (E)

#### Plants

- fleshy (=succulent) owl's-clover, *Castilleja campestris* ssp. *succulenta* (T)

#### Proposed Species

##### Birds

- mountain plover, *Charadrius montanus* (PT)

#### Candidate Species

##### Amphibians

- California tiger salamander, *Ambystoma californiense* (C)

##### Fish

- Central Valley fall/late fall-run chinook salmon, *Oncorhynchus tshawytscha* (C) NMFS
- Critical habitat, Central Valley fall/late fall-run chinook, *Oncorhynchus tshawytscha* (C) NMFS

#### Species of Concern

##### Mammals

- Pacific western big-eared bat, *Corynorhinus* (=Plecotus) *townsendii townsendii* (SC)
- small-footed myotis bat, *Myotis ciliolabrum* (SC)
- long-legged myotis bat, *Myotis volans* (SC)
- Yuma myotis bat, *Myotis yumanensis* (SC)
- San Joaquin pocket mouse, *Perognathus inornatus* (SC)

##### Birds

- tricolored blackbird, *Agelaius tricolor* (SC)
- grasshopper sparrow, *Ammodramus savannarum* (SC)
- short-eared owl, *Asio flammeus* (SC)
- western burrowing owl, *Athene cunicularia hypugaea* (SC)
- oak titmouse, *Baeolophus inornatus* (SLC)
- Aleutian Canada goose, *Branta canadensis leucopareia* (D)
- Swainson's hawk, *Buteo Swainsoni* (CA)
- ferruginous hawk, *Buteo regalis* (SC)
- Lawrence's goldfinch, *Carduelis lawrencei* (SC)
- Vaux's swift, *Chaetura vauxi* (SC)
- black tern, *Chlidonias niger* (SC)
- white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)
- little willow flycatcher, *Empidonax traillii brewsteri* (CA)

- American peregrine falcon, *Falco peregrinus anatum* (D)
- greater sandhill crane, *Grus canadensis tabida* (CA)
- loggerhead shrike, *Lanius ludovicianus* (SC)
- Lewis' woodpecker, *Melanerpes lewis* (SC)
- long-billed curlew, *Numenius americanus* (SC)
- Nuttall's woodpecker, *Picoides nuttallii* (SLC)
- white-faced ibis, *Plegadis chihi* (SC)
- bank swallow, *Riparia riparia* (CA)
- rufous hummingbird, *Selasphorus rufus* (SC)

#### Reptiles

- northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
- California horned lizard, *Phrynosoma coronatum frontale* (SC)

#### Amphibians

- foothill yellow-legged frog, *Rana boylei* (SC)
- western spadefoot toad, *Spea hammondi* (SC)

#### Fish

- green sturgeon, *Acipenser medirostris* (SC)
- river lamprey, *Lampetra ayresii* (SC)
- Kern brook lamprey, *Lampetra hubbsi* (SC)
- Pacific lamprey, *Lampetra tridentata* (SC)
- longfin smelt, *Spirinchus thaleichthys* (SC)

#### Invertebrates

- Antioch Dunes anthicid beetle, *Anthicus antiochensis* (SC)
- Sacramento anthicid beetle, *Anthicus sacramento* (SC)
- Midvalley fairy shrimp, *Branchinecta mesoamericana* (SC)
- California linderiella fairy shrimp, *Linderiella occidentalis* (SC)

#### Plants

- Boggs Lake hedge-hyssop, *Gratiola heterosepala* (CA)
- legumere, *Legumere limosa* (SC)
- valley sagittaria (=Sanford's arrowhead), *Sagittaria sanfordii* (SC)

Endangered and Threatened Species that May Occur in or be Affected by  
Projects in the Area of the Following California Counties

Reference File No. 1-1-02-TA-0501

February 20, 2002

**SACRAMENTO COUNTY**

**Listed Species**

**Mammals**

- riparian (San Joaquin Valley) woodrat, *Neotoma fuscipes riparia* (E) \*

**Birds**

- bald eagle, *Haliaeetus leucocephalus* (T)

**Reptiles**

- giant garter snake, *Thamnophis gigas* (T)

**Amphibians**

- California red-legged frog, *Rana aurora draytonii* (T)

**Fish**

- Central Valley spring-run chinook salmon, *Oncorhynchus tshawytscha* (T) NMFS
- Central Valley steelhead, *Oncorhynchus mykiss* (T) NMFS
- Critical Habitat, Central Valley spring-run chinook, *Oncorhynchus tshawytscha* (T) NMFS
- Critical habitat, Central Valley steelhead, *Oncorhynchus mykiss* (T) NMFS
- Critical habitat, delta smelt, *Hypomesus transpacificus* (T)
- Critical habitat, winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS
- Sacramento splittail, *Pogonichthys macrolepidotus* (T)
- delta smelt, *Hypomesus transpacificus* (T)
- winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS

**Invertebrates**

- Conservancy fairy shrimp, *Branchinecta conservatio* (E)
- Critical habitat, valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)
- delta green ground beetle, *Elaphrus viridis* (T)
- valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)
- vernal pool fairy shrimp, *Branchinecta lynchi* (T)
- vernal pool tadpole shrimp, *Lepidurus packardii* (E)

**Plants**

- Antioch Dunes evening-primrose, *Oenothera deltoides ssp. howellii* (E)
- Sacramento Orcutt grass, *Orcuttia viscida* (E)
- slender Orcutt grass, *Orcuttia tenuis* (T)
- soft bird's-beak, *Cordylanthus mollis ssp. mollis* (E) \*

**Proposed Species**

## Birds

- mountain plover, *Charadrius montanus* (PT)

**Candidate Species**

## Birds

- Western yellow-billed cuckoo, *Coccyzus americanus occidentalis* (C)

## Amphibians

- California tiger salamander, *Ambystoma californiense* (C)

## Fish

- Central Valley fall/late fall-run chinook salmon, *Oncorhynchus tshawytscha* (C) NMFS
- Critical habitat, Central Valley fall/late fall-run chinook, *Oncorhynchus tshawytscha* (C) NMFS

**Species of Concern**

## Mammals

- Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)
- San Francisco dusky-footed woodrat, *Neotoma fuscipes annectens* (SC)
- San Joaquin pocket mouse, *Perognathus inornatus* (SC)
- Yuma myotis bat, *Myotis yumanensis* (SC)
- fringed myotis bat, *Myotis thysanodes* (SC)
- greater western mastiff-bat, *Eumops perotis californicus* (SC)
- ✓ long-eared myotis bat, *Myotis evotis* (SC)
- long-legged myotis bat, *Myotis volans* (SC)
- ✓ pale Townsend's big-eared bat, *Corynorhinus (=Plecotus) townsendii pallascens* (SC)
- small-footed myotis bat, *Myotis ciliolabrum* (SC)

## Birds

- Aleutian Canada goose, *Branta canadensis leucopareia* (D)
- American bittern, *Botaurus lentiginosus* (SC)
- American peregrine falcon, *Falco peregrinus anatum* (D)
- Brewer's sparrow, *Spizella breweri* (SC)
- California thrasher, *Toxostoma redivivum* (SC)
- Lawrence's goldfinch, *Carduelis lawrencei* (SC)
- Lewis' woodpecker, *Melanerpes lewis* (SC)
- Nuttall's woodpecker, *Picoides nuttallii* (SLC)
- Snowy Egret, *Egretta thula* (MB)
- Swainson's hawk, *Buteo Swainsoni* (CA)
- bank swallow, *Riparia riparia* (CA)
- black rail, *Laterallus jamaicensis coturniculus* (CA)

- black tern, *Chlidonias niger* (SC)
- common loon, *Gavia immer* (SC)
- ferruginous hawk, *Buteo regalis* (SC)
- grasshopper sparrow, *Ammodramus savannarum* (SC)
- greater sandhill crane, *Grus canadensis tabida* (CA)
- little willow flycatcher, *Empidonax traillii brewsteri* (CA)
- loggerhead shrike, *Lanius ludovicianus* (SC)
- long-billed curlew, *Numerius americanus* (SC)
- oak titmouse, *Baeolophus inornatus* (SLC)
- rufous hummingbird, *Selasphorus rufus* (SC)
- short-eared owl, *Asio flammeus* (SC)
- tricolored blackbird, *Agelaius tricolor* (SC)
- western burrowing owl, *Athene cunicularia hypugaea* (SC)
- white-faced ibis, *Plegadis chihi* (SC)
- white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)

#### Reptiles

- California horned lizard, *Phrynosoma coronatum frontale* (SC)
- northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
- silvery legless lizard, *Anniella pulchra pulchra* (SC)
- southwestern pond turtle, *Clemmys marmorata pallida* (SC)

#### Amphibians

- foothill yellow-legged frog, *Rana boylei* (SC)
- western spadefoot toad, *Spea hammondi* (SC)

#### Fish

- Kern brook lamprey, *Lampetra hubbsi* (SC)
- Pacific lamprey, *Lampetra tridentata* (SC)
- green sturgeon, *Acipenser medirostris* (SC)
- longfin smelt, *Spirinchus thaleichthys* (SC)
- river lamprey, *Lampetra ayresi* (SC)

#### Invertebrates

- Antioch Dunes anthicid beetle, *Anthicus antiochensis* (SC)
- California linderiella fairy shrimp, *Linderiella occidentalis* (SC)
- Midvalley fairy shrimp, *Branchinecta mesoamericana* (SC)
- Sacramento anthicid beetle, *Anthicus sacramento* (SC)
- San Joaquin dune beetle, *Coelus gracilis* (SC)
- curved-foot hygrotus diving beetle, *Hygrotus curvipes* (SC)

## Plants

- Ahart's (dwarf) rush, *Juncus leiospermus* var. *ahartii* (SC)
- Amador (Bisbee Peak) rush-rose, *Helianthemum suffrutescens* (SLC)
- Boggs Lake hedge-hyssop, *Gratiola heterosepala* (CA)
- Mason's lilaeopsis, *Lilaeopsis masonii* (SC)
- Northern California black walnut, *Juglans californica* var. *hindsii* (SC) \*
- Red Bluff (dwarf) rush, *Juncus leiospermus* var. *leiospermus* (SC)
- San Joaquin spearscale (=saltbush), *Atriplex joaquiniana* (SC)
- Suisun Marsh aster, *Aster lentus* (SC)
- Tuolumne coyote-thistle (=button-celery), *Eryngium pinnatisectum* (SC)
- delta tule-pea, *Lathyrus jepsonii* var. *jepsonii* (SC)
- legenere, *Legenere limosa* (SC)
- pincushion navarretia, *Navarretia myersii* spp. *myersii* (SC)
- stinkbells, *Fritillaria agrestis* (SLC)
- valley sagittaria (=Sanford's arrowhead), *Sagittaria sanfordii* (SC)

## KEY:

(E)	<i>Endangered</i>	Listed (in the Federal Register) as being in danger of extinction.
(T)	<i>Threatened</i>	Listed as likely to become endangered within the foreseeable future.
(P)	<i>Proposed</i>	Officially proposed (in the Federal Register) for listing as endangered or threatened.
(PX)	<i>Proposed Critical Habitat</i>	Proposed as an area essential to the conservation of the species.
(C)	<i>Candidate</i>	Candidate to become a <i>proposed</i> species.
(SC)	<i>Species of Concern</i>	Other species of concern to the Service.
(SLC)	<i>Species of Local Concern</i>	Species of local or regional concern or conservation significance.
(D)	<i>Delisted</i>	Delisted. Status to be monitored for 5 years.
(CA)	<i>State-Listed</i>	Listed as threatened or endangered by the State of California.
NMFS	NMFS species	Under jurisdiction of the National Marine Fisheries Service. Contact them directly.
*	<i>Extirpated</i>	Possibly extirpated from the area.
**	<i>Extinct</i>	Possibly extinct
	<i>Critical Habitat</i>	Area essential to the conservation of a species.

## **CPP: INDIRECT IMPACTS TO FAIRY SHRIMP ON THE CPP SITE, LAYDOWN AREA, TRANSMISSION LINE TOWERS, WATER SUPPLY LINE, AND ACCESS ROAD**

PREPARED FOR: File

PREPARED BY: EJ Koford

June 5, 2002

Under Programmatic Opinion (1-1-96-F-1), USFWS describes indirect impacts as those that affect habitat supported by upland areas and swales, and all habitat otherwise damaged by loss of watershed, human intrusion, introduced species, and pollution caused by the project. "Where the reach of these effects cannot be determined definitively, all habitat within 250 feet of proposed development may be considered indirectly affected."

The CPP project was sited with the objective of minimizing direct impacts to vernal pools and wetlands. Identifying indirect impacts to fairy shrimp, as defined by the programmatic opinion, is the goal of this technical memorandum.

### **Natural Gas Pipeline**

For the natural gas pipeline, vernal pools, constructed vernal pools, railroad and roadside pools and non-jurisdictional pools that ponded water in the spring were considered potential fairy shrimp habitat. Some features that appear on photographs to be potential wetland features were excluded from consideration as potential fairy shrimp habitat, if they did not pond water in February.

Also excluded were hydrologic features that were within 250 feet, but separated from the gas pipeline by a clear topographic boundary (such as the railroad berm, paved road or highway), or that were clearly upgradient of construction.

Most of the gas pipeline is bordered by residential uses, disked or plowed agricultural uses, or vineyards which limits the potential for fairy shrimp. In general, habitats where potential indirect impacts to fairy shrimp were identified were concentrated on the west side of the pipeline between Elk Grove Blvd and Franklin (in the Laguna-Stone Lakes Wetland preserve area), and in railroad and roadside ditches between Twin Cities Road and the railroad.

To quantify the area of impacts, a 250-foot buffer was demarcated on each side of the construction corridor for the pipeline, and any wetlands that fell within the buffer that were down gradient (or level), had water in February, and characteristics generally indicative of fairy shrimp were counted as indirectly affected. The total area of fairy shrimp habitat quantified by this method was 6.96 acres. Further field verifications of the hydrology of these ponds may reduce this area slightly.

### **Project Site**

For the project site, a very similar method was used, but because there were site-specific delineations and limited fairy shrimp surveys, the data are more defined. Generally



quiescent hydric features identified as vernal pools are considered fairy shrimp habitat. Swales which indicate seasonal flowing water or water with fish in it (Clay Creek and direct tributaries, or swales that are dry in February were not considered fairy shrimp habitat.

Hydric features separated from the project site by a clear hydrologic boundary (e.g. on the opposite side of Clay Creek) would have been excluded, but as it happens none occur in this condition. Similarly hydric features that are clearly upgradient of construction would be excluded but did not occur.

The project site is on a slope that was selected in part because of the paucity of vernal pools and wetlands. Transmission poles were sited to avoid wetlands, as was the water supply pipeline.

To quantify the area of impacts, a 250-foot buffer was demarcated around the construction footprint of the project site, laydown area, water supply pipeline, transmission lines and access road. Any wetlands that fell within the buffer that were down gradient (or level), had water in February, and characteristics generally indicative of fairy shrimp were counted as indirectly affected. Pools that were partly covered by direct impacts (east end of laydown area, northeast corner of stormwater pond) were counted already as direct impacts.

The largest features potentially indirectly affected by project construction are three areas described as degraded wetlands (DW) in the delineation by Davis Environmental Consulting. These low swales are generally turbid, lack vegetation and generally look very different from vernal pools in the area. Nevertheless, tadpole shrimp may occur in them. We know from consultations with SMUD personnel that these ponds were excavated, lined with plastic and used to store wastewater during the construction of Rancho Seco. Various reports indicate they stored wash water that might have contained trisodium phosphate, "EDTA" or mild acid. We do not know if there were historical pools at the site prior to excavation. SMUD has proposed restoration of these ponds as part of their wetland mitigation.

The total area of fairy shrimp habitat quantified by this method was 1.95 acres (see Table 1). Further field verifications of the hydrology of these ponds may reduce or increase this area slightly.

**TABLE 1.**  
 Potential Fairy Shrimp Habitat Within “Indirect Impact Area” of Project Site, Laydown Area, Transmission  
 Towers and Water Supply Line for Cosumnes Power Plant Project

Location/ID	Project Feature	Type	Size (acres)	Data Source
DSW 1	Water Supply Pipeline	Degraded Seasonal Wetland	1.224	DEC, 2000
DSW 2	Water Supply Pipeline	Degraded Seasonal Wetland	0.228	DEC, 2000
DSW 3	Water Supply Pipeline	Degraded Seasonal Wetland	0.349	DEC, 2000
HVP3	Water Supply Pipeline	Vernal pool	0.041	DEC, 2000
HVP4	Water Supply Pipeline	Vernal pool	0.069	DEC, 2000
SW11	Plant Site	Seasonal wetland/ degraded seasonal wetland	0.039	DEC, 2000
<b>Total for all wetland areas and other waters of the U.S.</b>			<b>1.95</b>	

**Note:**

Wetland descriptions and areas taken from reports as referenced with the following exception. The JAS (1993) wetland crossings were mapped by JAS but the areas of potential impact were determined by field measurements taken by CH2MHILL personnel on May 29, 2002.

# Contingency Plan for Horizontal Directional Drilling

The natural gas pipeline extension to the Cosumnes Power Plant (CPP) is proposed to cross the Cosumnes River, Badger Creek, and Laguna Creek by Horizontal Directional Drilling (HDD). HDD is less intrusive than traditional open-cut trenching where habitats sustain direct soil disturbance.

Frac-out, or inadvertent return of drilling lubricant, is a potential concern when the HDD is used under sensitive habitats and waterways. The HDD procedure uses bentonite slurry, a fine clay material as a drilling lubricant. The bentonite is non-toxic and commonly used in farming practices, but benthic invertebrates, aquatic plants, and fish and their eggs can be smothered by the fine particles if bentonite were discharged to waterways.

The purpose of a Contingency Plan or “Frac-out” plan is to:

- Minimize the potential for a frac-out associated with horizontal directional drilling activities
- Provide for the timely detection of frac-outs
- Protect areas that are considered environmentally sensitive (streams, wetlands, other biological resources, cultural resources)
- Ensure an organized, timely, and “minimum-impact” response in the event a frac-out and release of drilling mud occur
- Ensure that all appropriate notifications are made to the CEC and environmental monitors immediately, and to appropriate regulatory agencies within 24 hours and that documentation is completed

The “Frac-out” plan is prepared by the drilling contractor, to ensure that preventive and responsive measures can be implemented by the contractor. To minimize the potential for a Frac-out, the Contingency Plan includes:

- Design protocols to be implemented for the protection of sensitive cultural and biological resources
- Design protocols to require a geotechnical engineer or qualified geologist to make recommendations regarding the suitability of the formations to be bored to minimize the potential for frac-out conditions

Prior to construction, sensitive biological resources will be protected by implementing the following measures:

- Sensitive biological resources will be flagged for avoidance or construction limits will be clearly marked
- Barriers (straw bales or sedimentation fences) will be erected between the bore site and nearby sensitive resources prior to drilling, as appropriate, to prevent released material from reaching the resource
- On-site briefings will be conducted for the workers to identify and locate sensitive resources at the site

- 
- Ensure that all field personnel understand their responsibility for timely reporting of frac-outs
  - Maintaining necessary response equipment on-site or at a readily accessible location and in good working order
  - Disallowing fill into waters of the United States unless proper permits have been obtained
  - Monitoring for the duration of drilling activities by a qualified biologist
  - Implement any of the mitigation measures specified by CDFG in its Streambed Alteration Agreement, pursuant to Fish and game Code Section 1603.

To further reduce the potential impacts of a frac-out, construction of the pipeline is expected to occur when there is least (or no) flow in the Cosumnes, Badger and Laguna Creeks. Construction is expected to begin in summer of 2003 and end in the fall of 2003. The drilling entry and exit areas will be clearly marked, surrounded by construction fencing and silt fencing to minimize the potential for all-site migration of drilling mud. Access and egress locations will be designated and clearly marked.

The primary areas of concern for inadvertent returns occur at the entrance and exit points where the drilling equipment are at depths of less than 12 to 20 feet deep. The likelihood of inadvertent return decreases as the depth of the pipe increases. To reduce the potential of a frac-out affecting sensitive resources, the entrance and exit points for drilling will be located at least 150 feet from riparian vegetation along the Cosumnes, Badger and Laguna Creeks.

To minimize the potential extent of impacts from a frac-out, all HDD will be attended by a full-time biological monitor, to look for observable “frac-out” conditions or lowered pressure readings on the drilling equipment. Early detection is key to minimizing the area of potential impact.

### **Contingency Response**

#### **Once a frac-out is identified:**

- All work stops, including the recycling of drilling mud/lubricant. The pressure of water above the pipe keeps excess mud from escaping through the fracture.
- Determine the location and extent of the frac-out.

#### **If the frac-out is terrestrial:**

- Isolate the area with hay bales, sand bags, or silt fencing to surround and contain the drilling mud.
- Consult with CDFG and property owner representative (i.e., Nature Conservancy) regarding next appropriate action among the following:
  - A mobile vacuum truck will be used to pump the drilling mud from the contained area and recycled to the return pit.
  - The drilling mud will be left in place to avoid potential damage from vehicles entering the area.
- Once excess drilling mud is removed, the area will be seeded and/or replanted using species similar to those in the adjacent area, or allowed to re-grow from existing vegetation.

- 
- Revegetated areas will be monitored twice per year for two years subsequent to frac-out to confirm revegetation is successful.

If the frac-out is aquatic (i.e., under water):

- Monitor frac-out for 4 hours to determine if the drilling mud congeals. (Bentonite will usually harden, effectively sealing the frac-out location).
- Consult with CDFG and property owner representative (i.e., Nature Conservancy) regarding next appropriate action among the following:
  - If drilling mud congeals, take no other action that would potentially suspend sediments in the water column.
  - If drilling mud does not congeal, erect isolation/containment environment (underwater boom and curtain).
  - If the fracture becomes excessively large, a spill response team would be called in to contain and clean up excess drilling mud in the water. Phone numbers of spill response teams in the area will be on site.
- If the spill affects an area that is vegetated, the area will be seeded and/or replanted using species similar to those in the adjacent area, or allowed to re-grow from existing vegetation.
- Revegetated areas will be monitored twice per year for two years subsequent to frac-out to confirm revegetation is successful.
- After frac-out is stabilized and any required removal is completed, document post-cleanup conditions with photographs and prepare frac-out incident report describing time, place, actions taken to remediate frac-out and measures implemented to prevent recurrence. Incident report will be provided to CEC and CDFG as part of project compliance not more than 30 days after the incident.